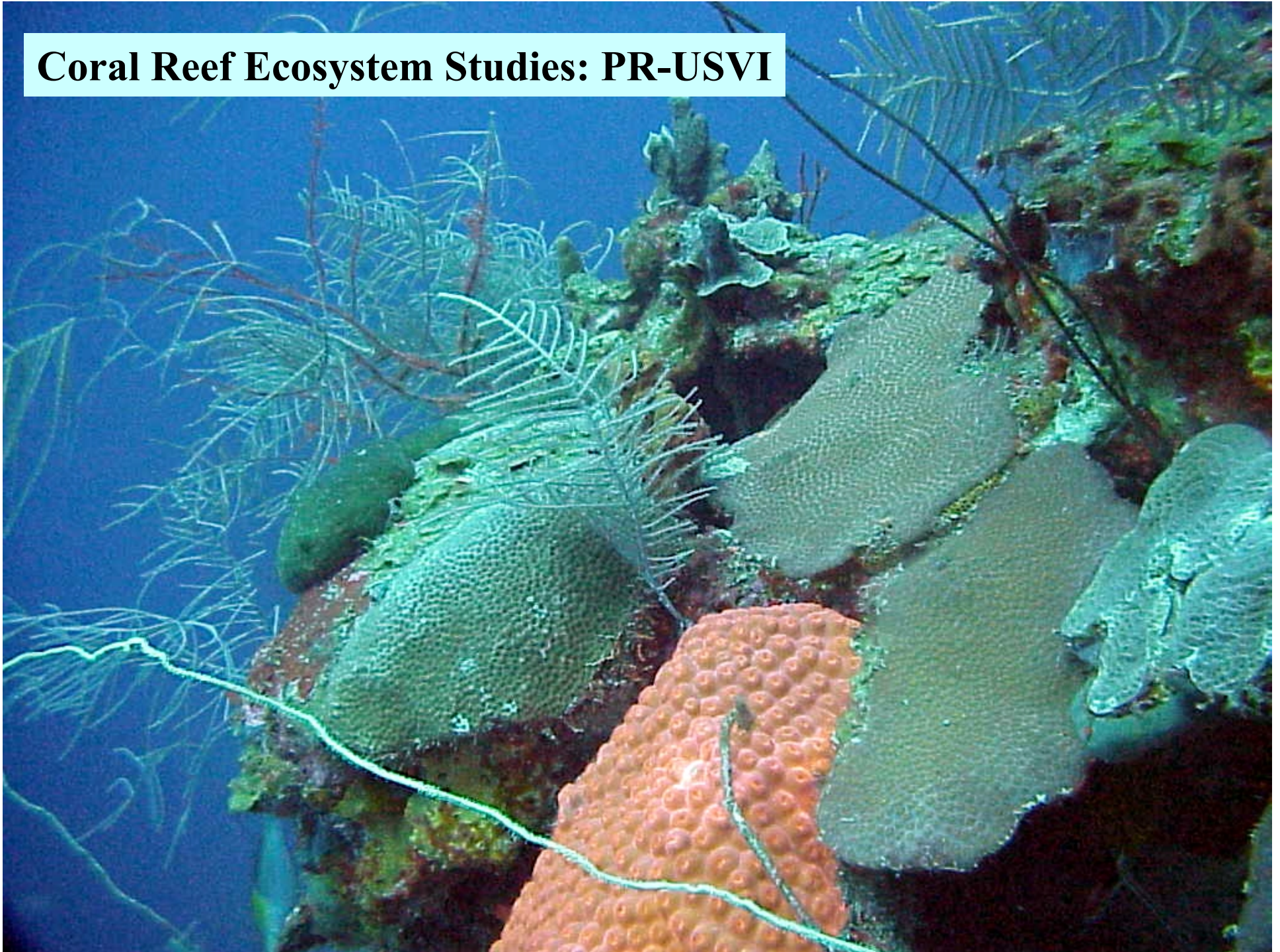
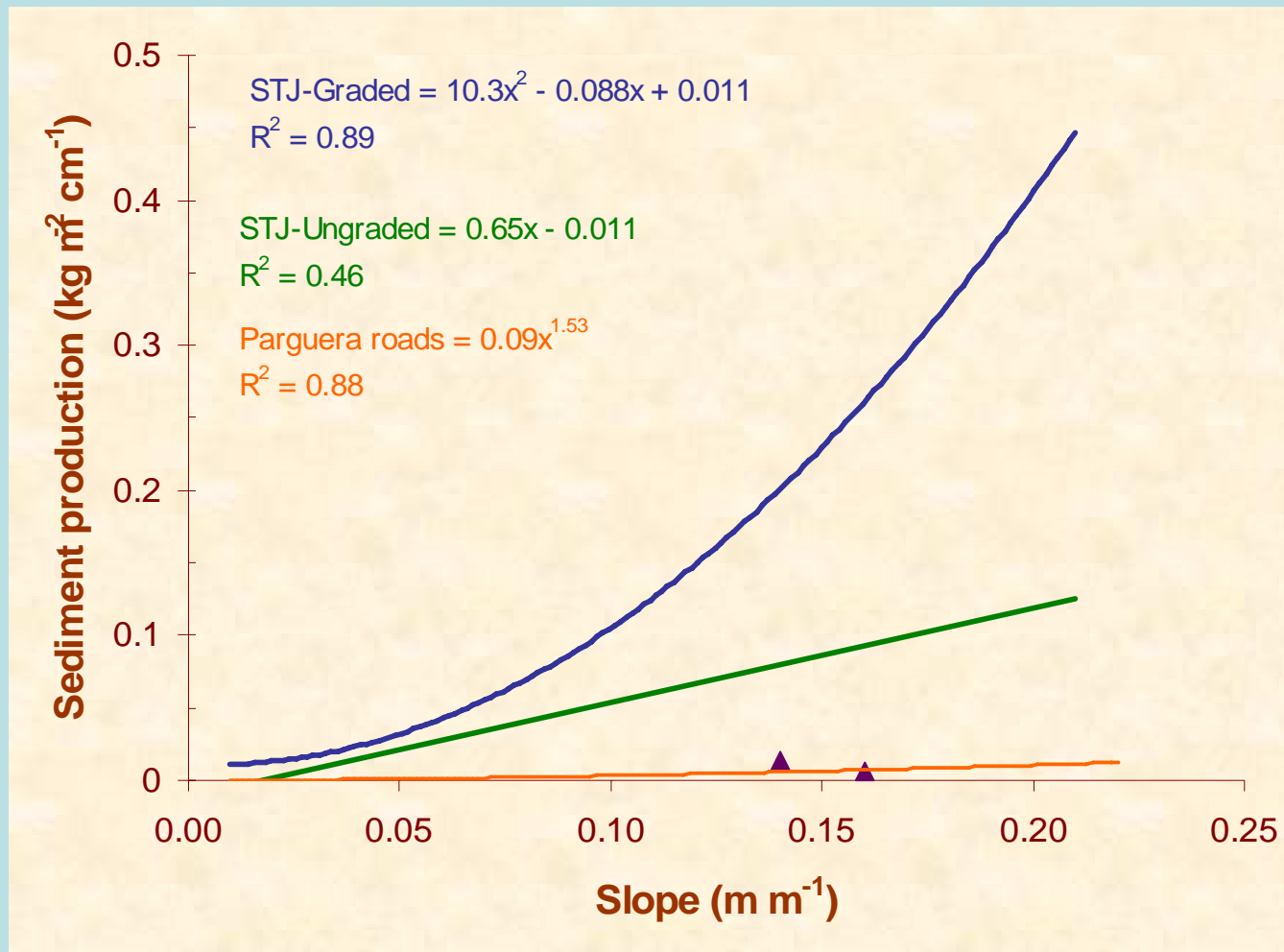


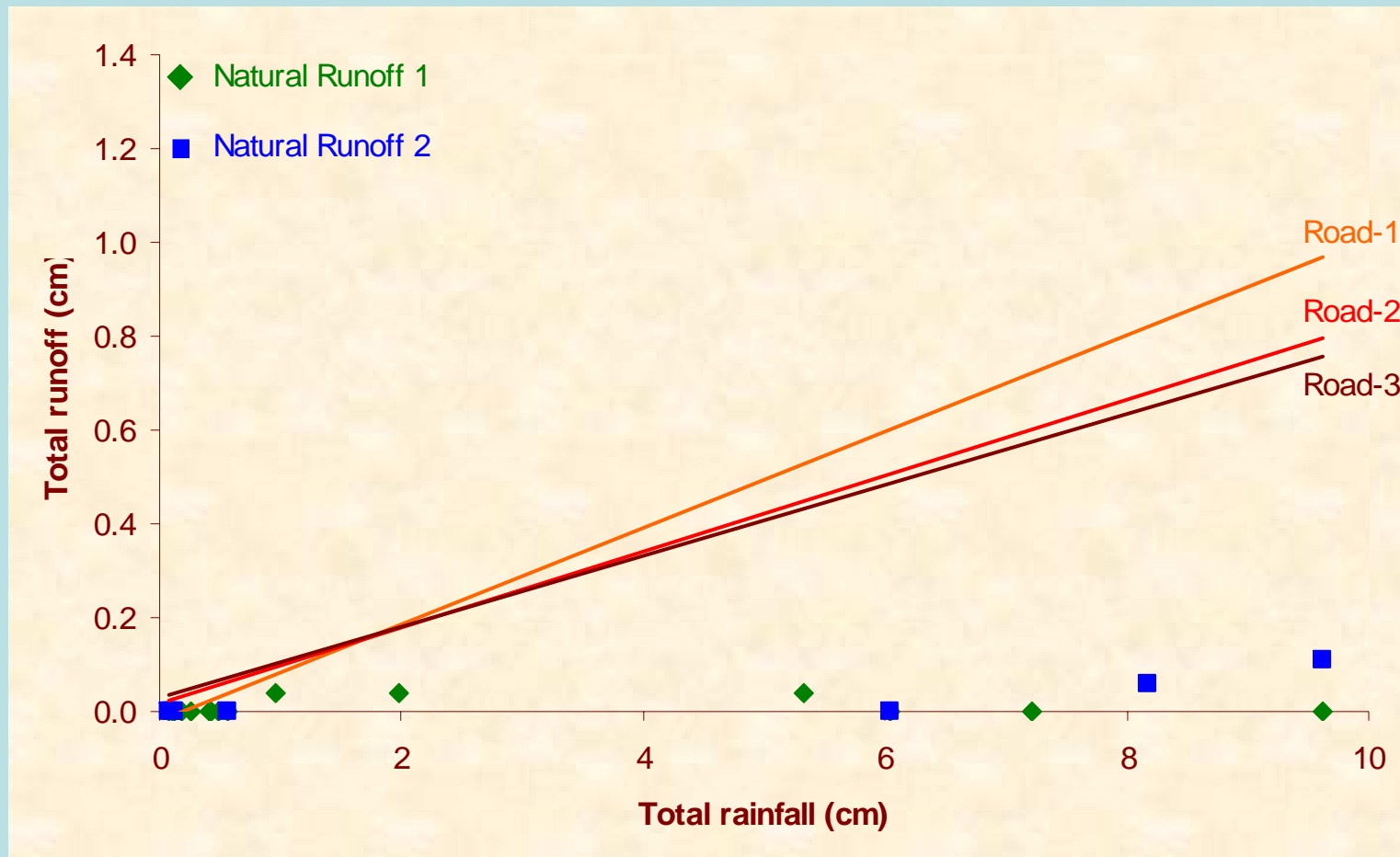
## **Coral Reef Ecosystem Studies: PR-USVI**



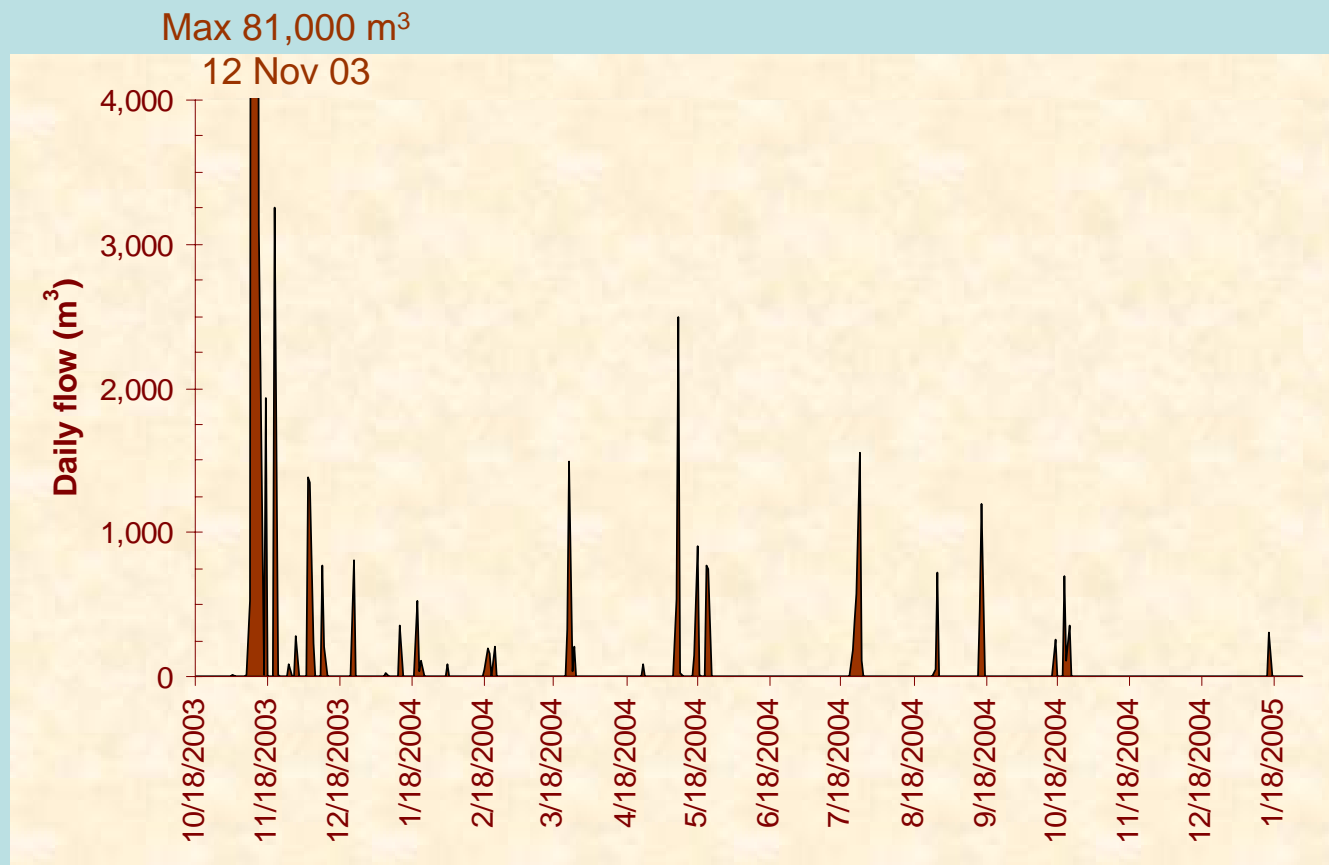
# Modeling sediment production from disturbed surfaces



# Plot-scale runoff response measurements



# Watershed-scale runoff measurements



Queb. Poblado  
Preliminary data

## What's the concern/hypothesis?

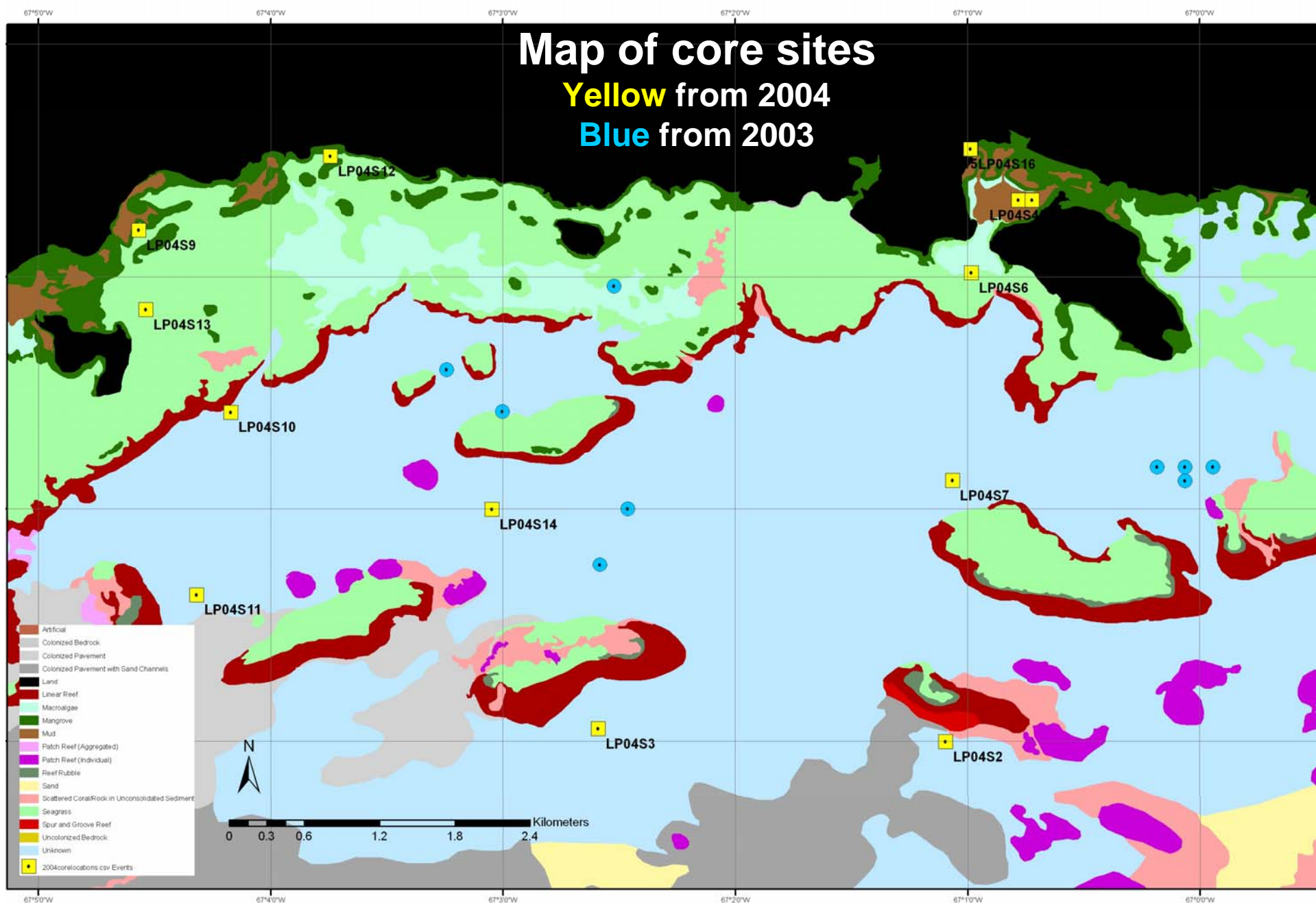
**Coastal development has led to increased terrestrial sediment accumulation in coral reef areas.**

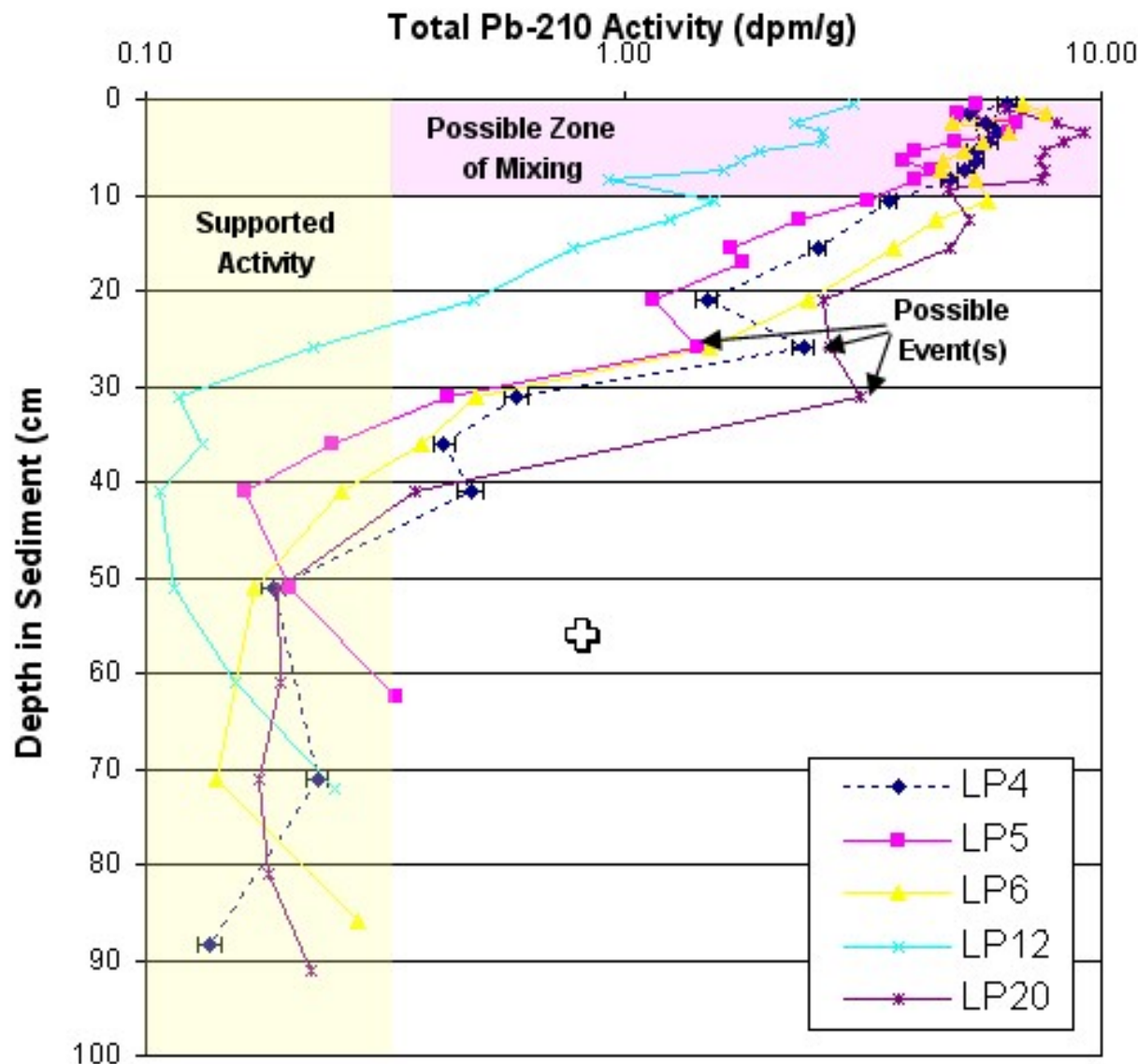


# Map of core sites

Yellow from 2004

Blue from 2003



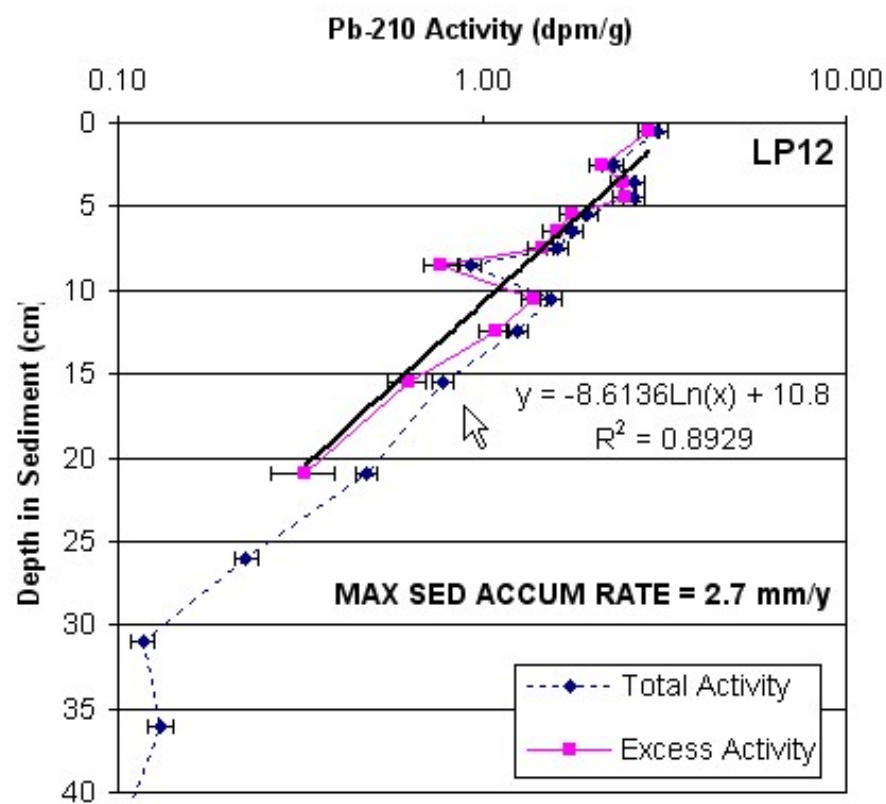
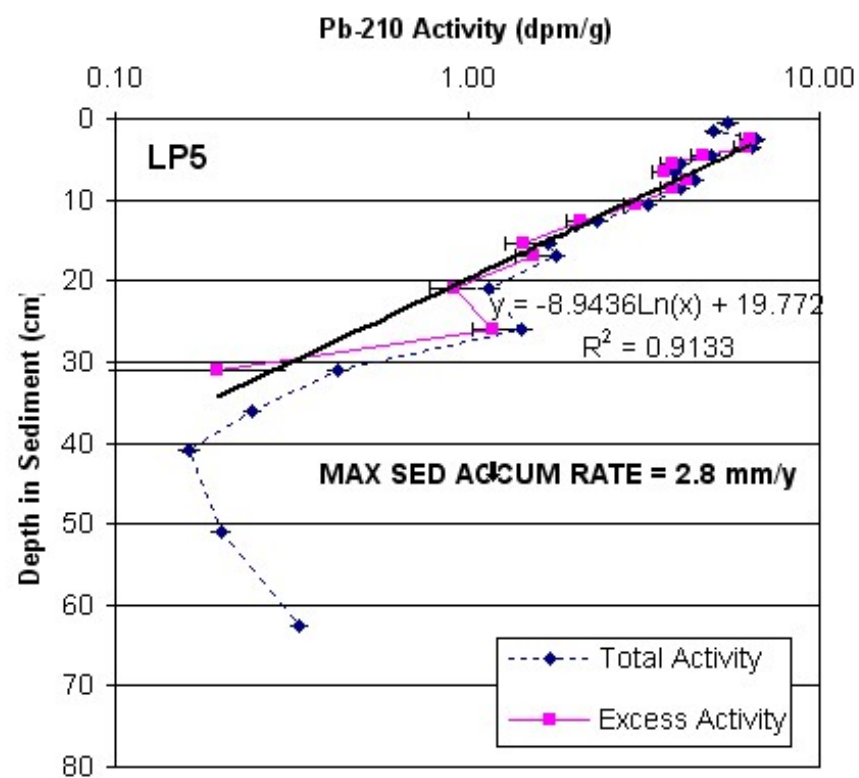


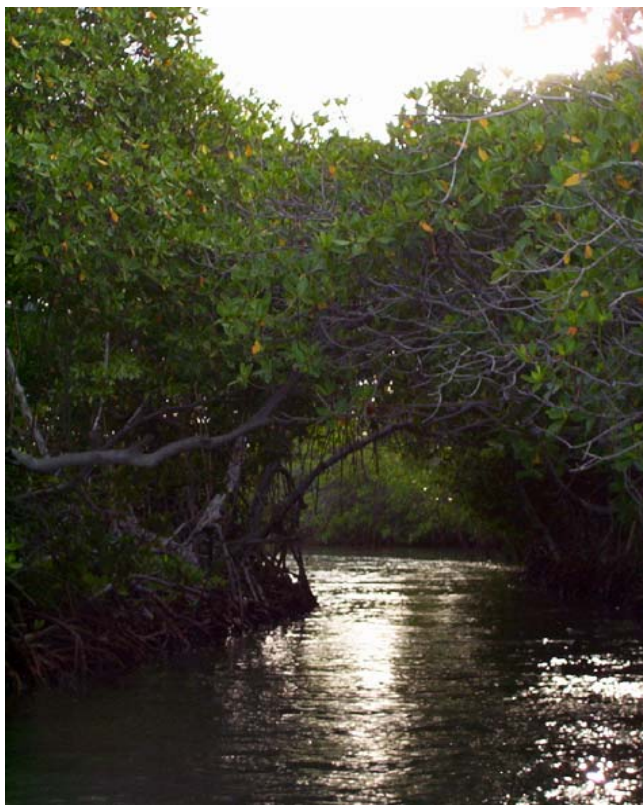
### **$^{210}\text{Pb}$ Data from 2003**

**Revealed log-linear decreases in activities with depth, probably reflecting steady-state accumulation.**

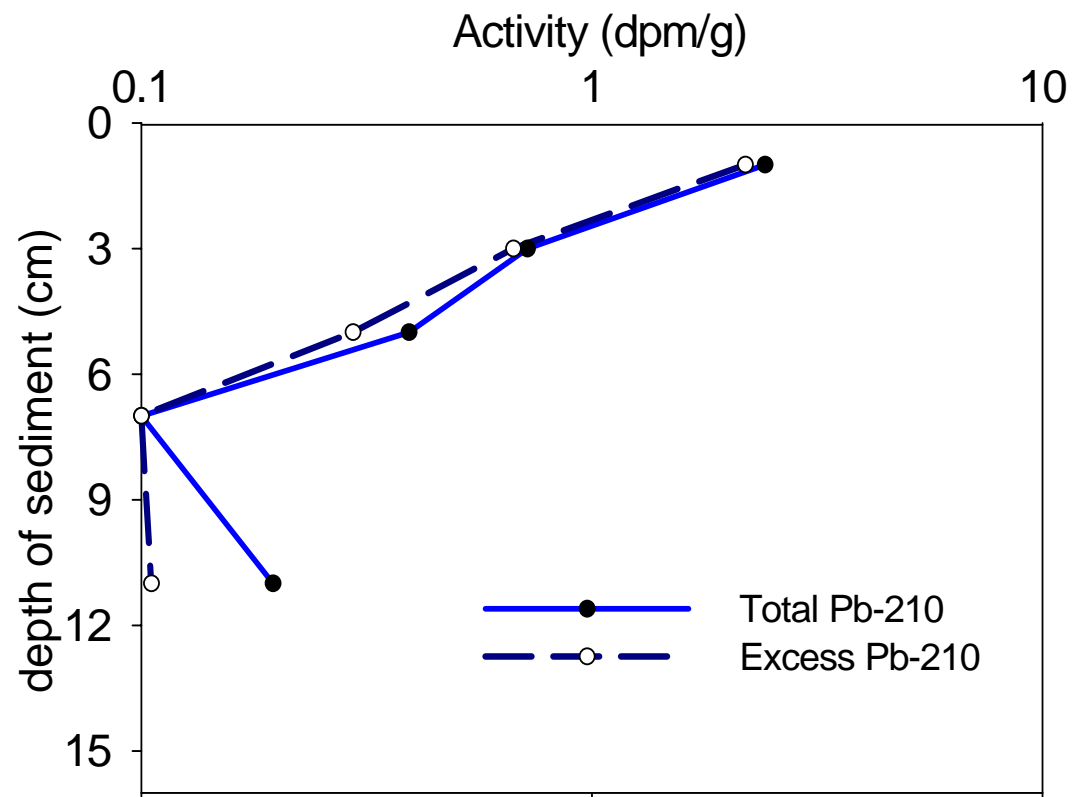
**Prominent peaks in activity profile may be related to fine-grain layers deposited by events.**

**But, cores collected in 2004 sampled a greater diversity of environments.**



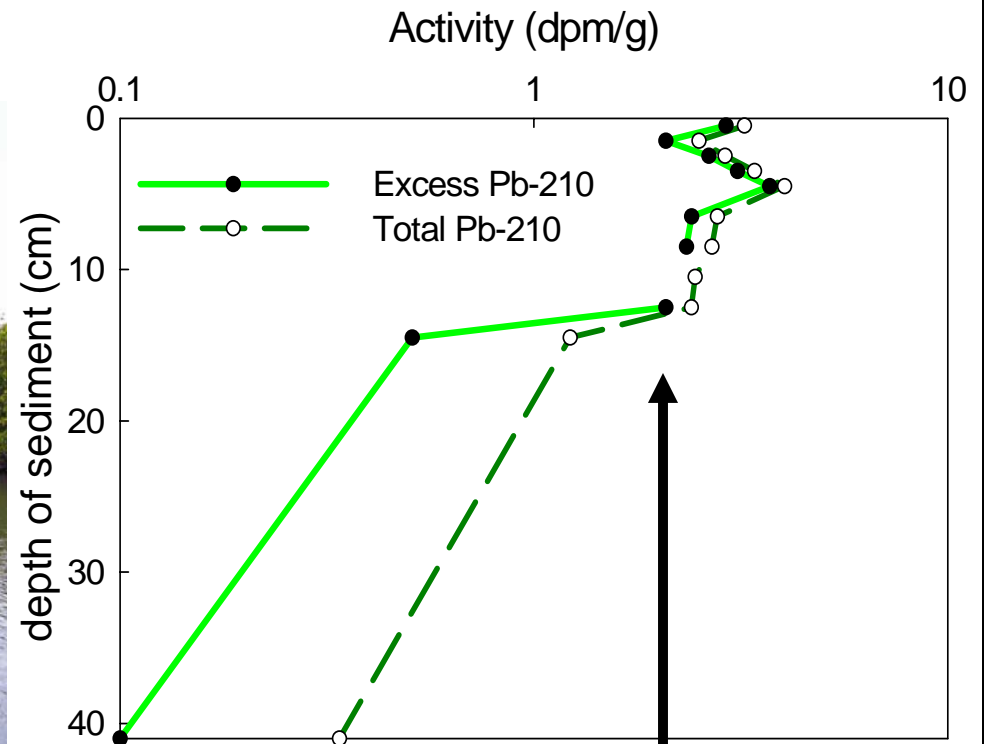


## Near Shore Site



**Rapid decrease of  $^{210}\text{Pb}$  with depth suggesting a low accumulation rate. Interestingly, this core was adjacent to the mangroves where higher rates of accumulation were anticipated.**

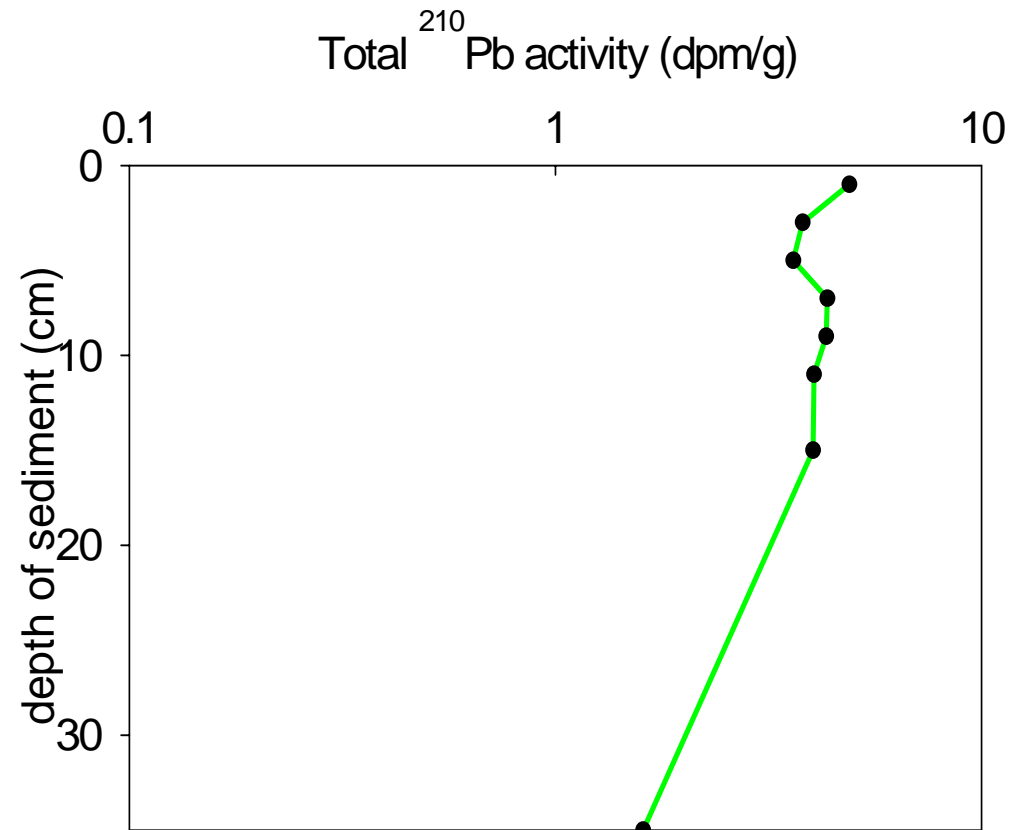
# Phosphorescent Bay



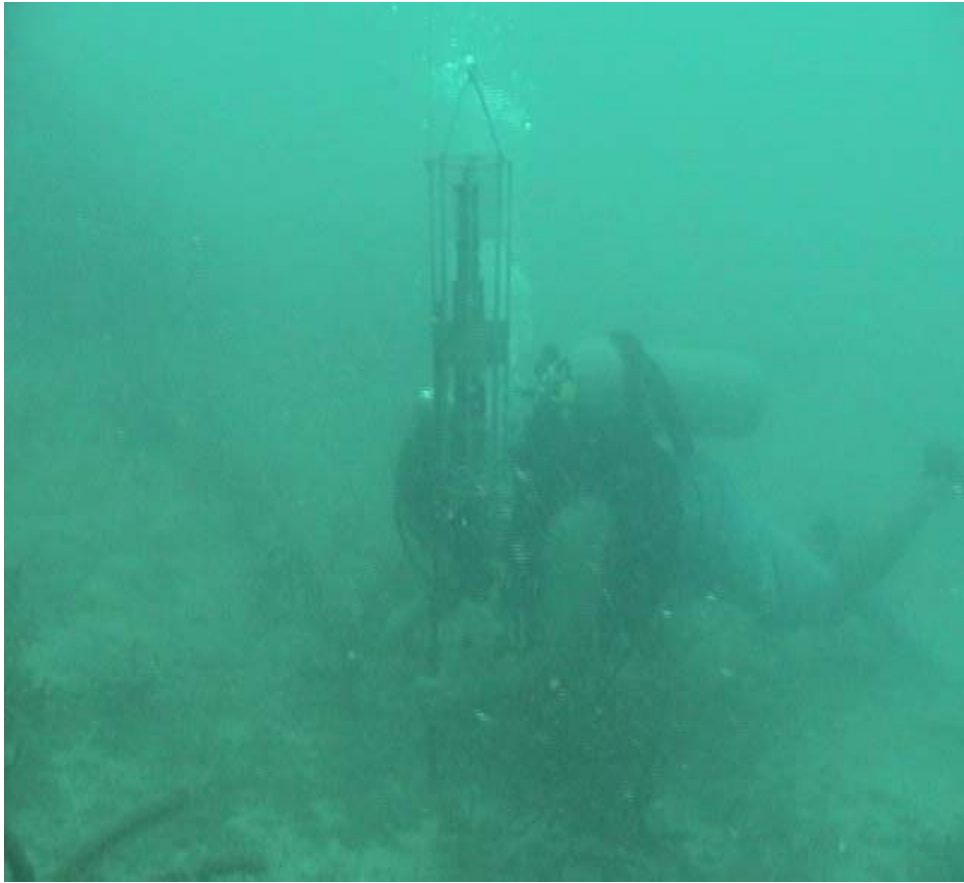
**Channel closure at Phosphorescent Bay may have resulted in a change in this notable change in sediment accumulation.**



## Reef Front, Site 3



**Gamma data from Site 3 suggest a steady-state profile may be found. Counting of deeper samples will be conducted.**



**Inshore: Las Pelotas**

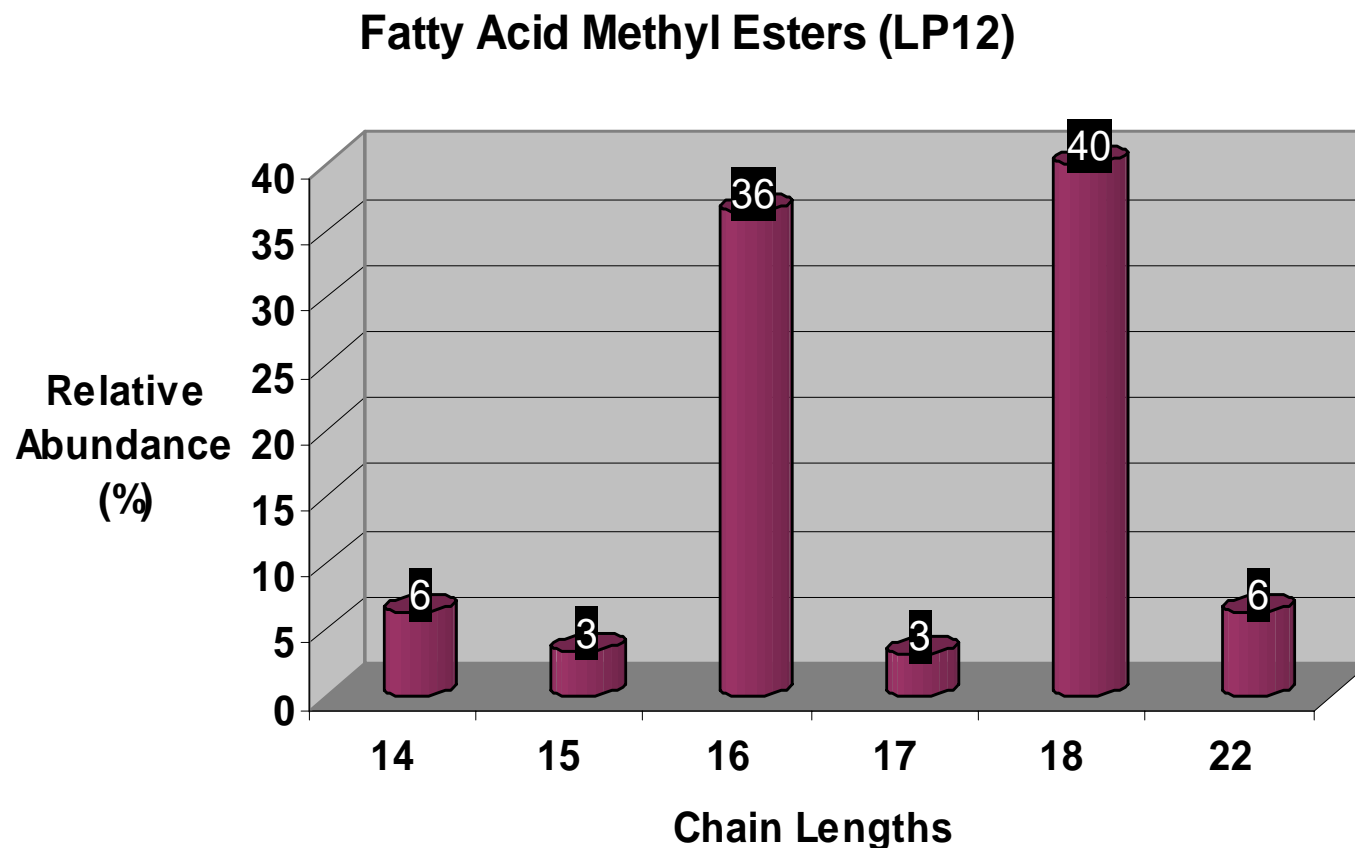


**Shelf-edge: Weinberg**

**Goal: to determine relative quantities of terrestrial/ marine materials in sediments using fatty acid biomarkers.**

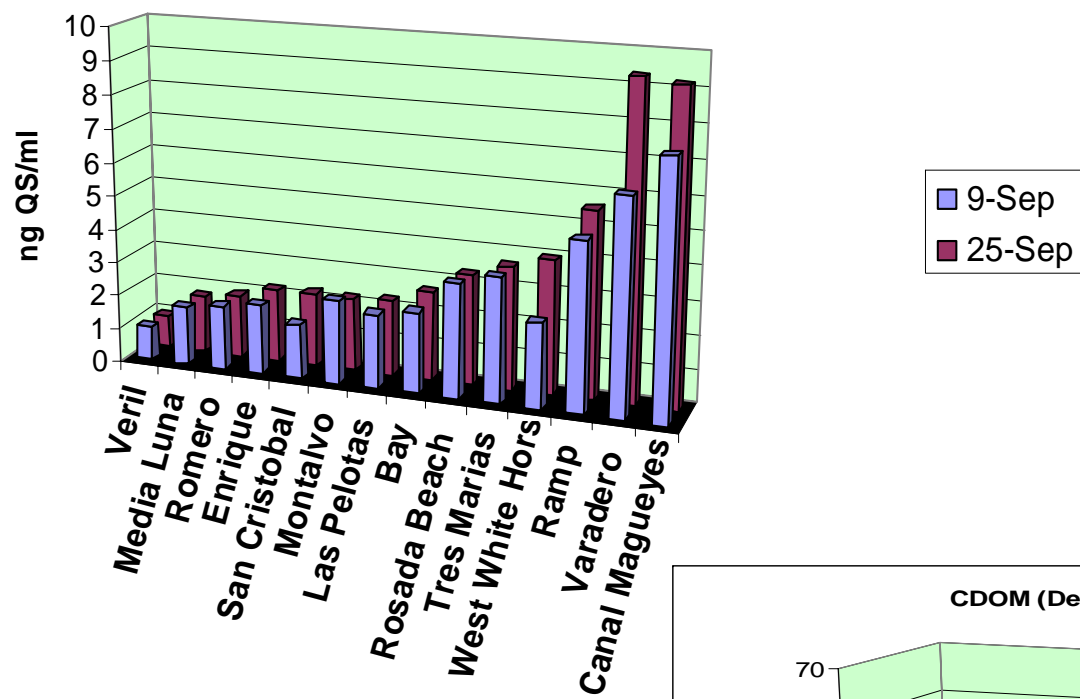
**Terrestrial:  $\delta^{13}\text{C}$ ,  $\text{C}_{25}\text{-C}_{35}$  n-alkanes, and  $\text{C}_{23}\text{-C}_{34}$  fatty acids, etc.**

**Marine:  $\text{C}_{17}\text{-C}_{20}$  n-alkanes, cholesterol, dinosterol, etc.**

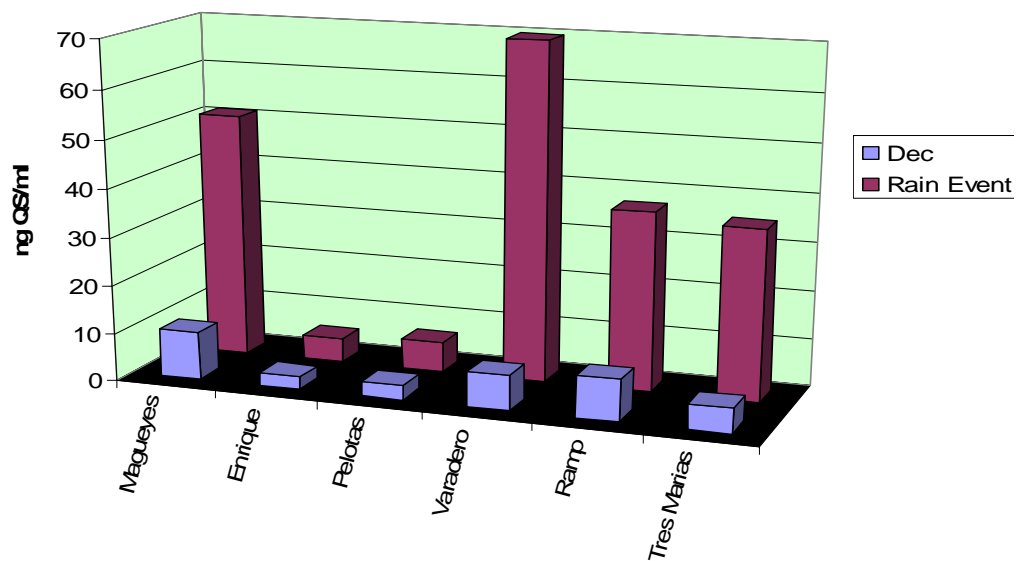


# CDOM Concentration as a Tracer of Terrestrial Inputs

CDOM Fluorescence (Bi-monthly comparison for September 2003)



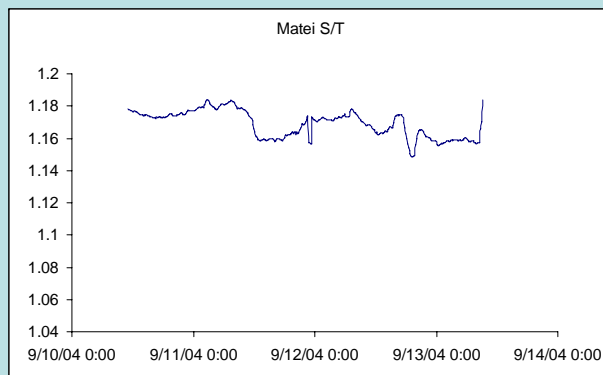
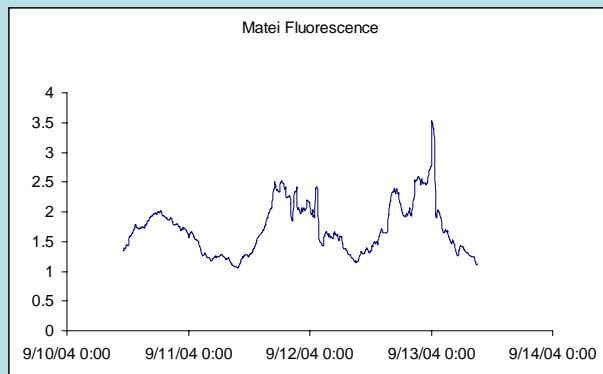
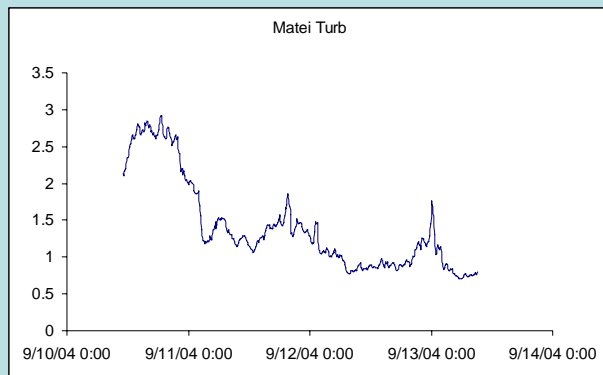
CDOM (Dec 03 and Rain Event of Nov 13 03)



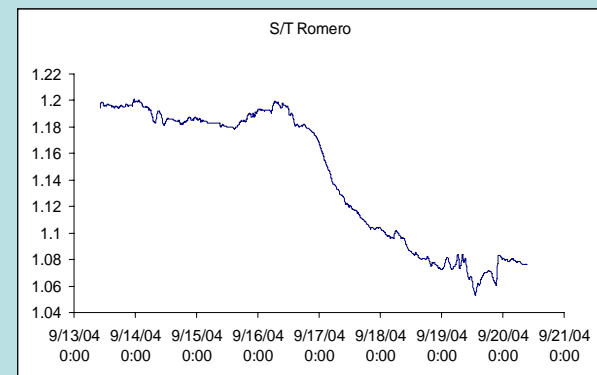
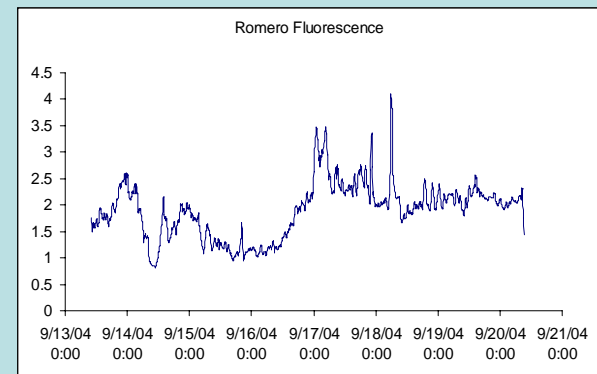
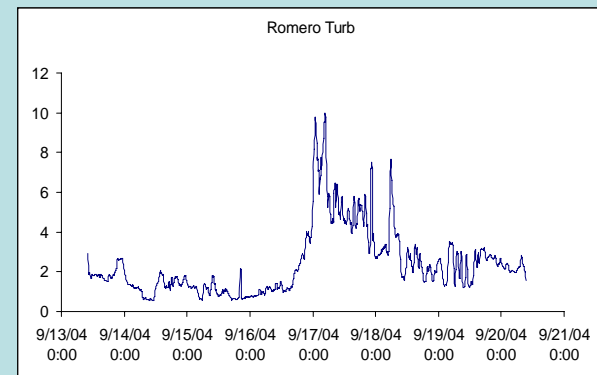
## September 2004: Hurricane Trajectories

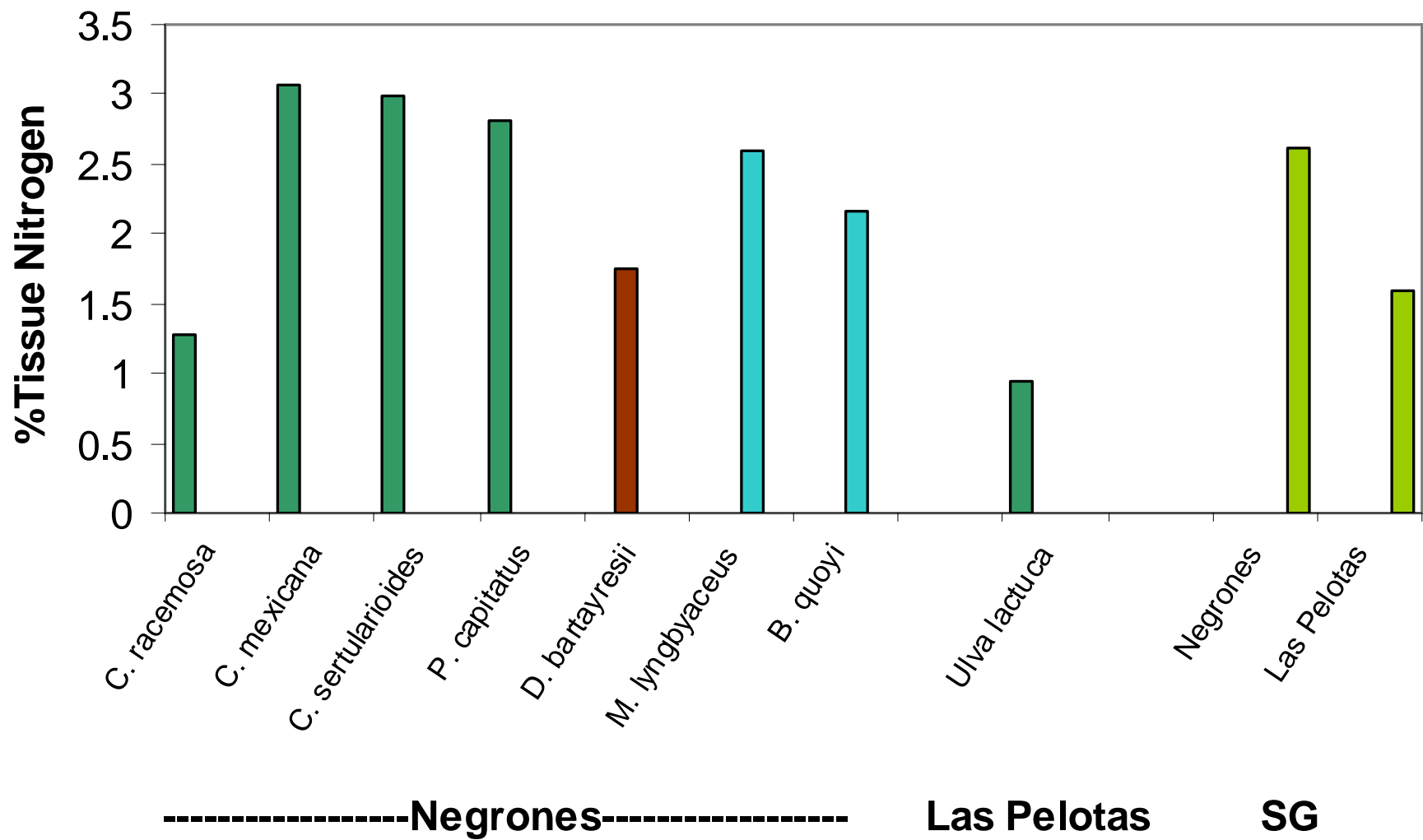


## Effects of Ivan

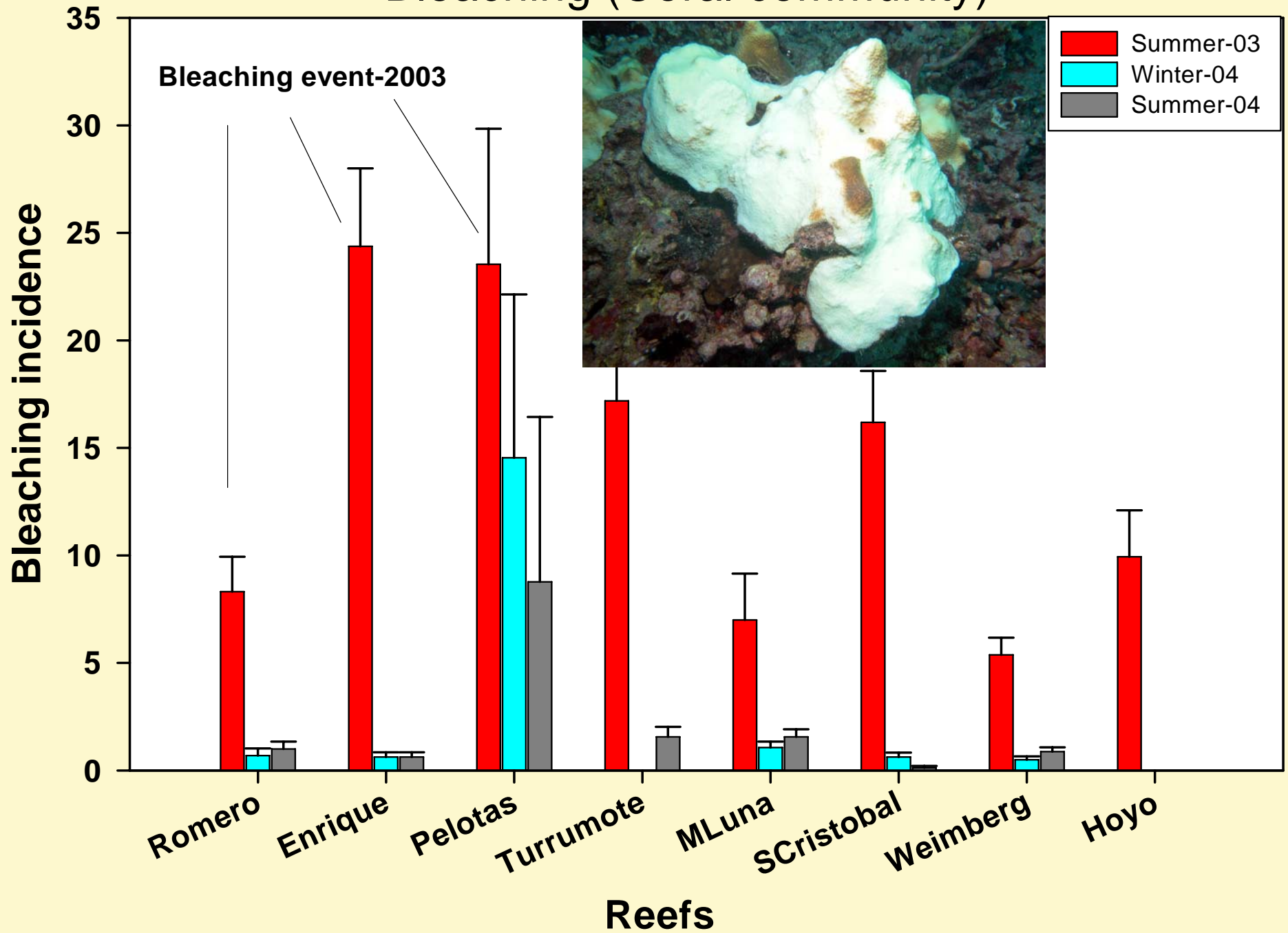


## Effects of Jean

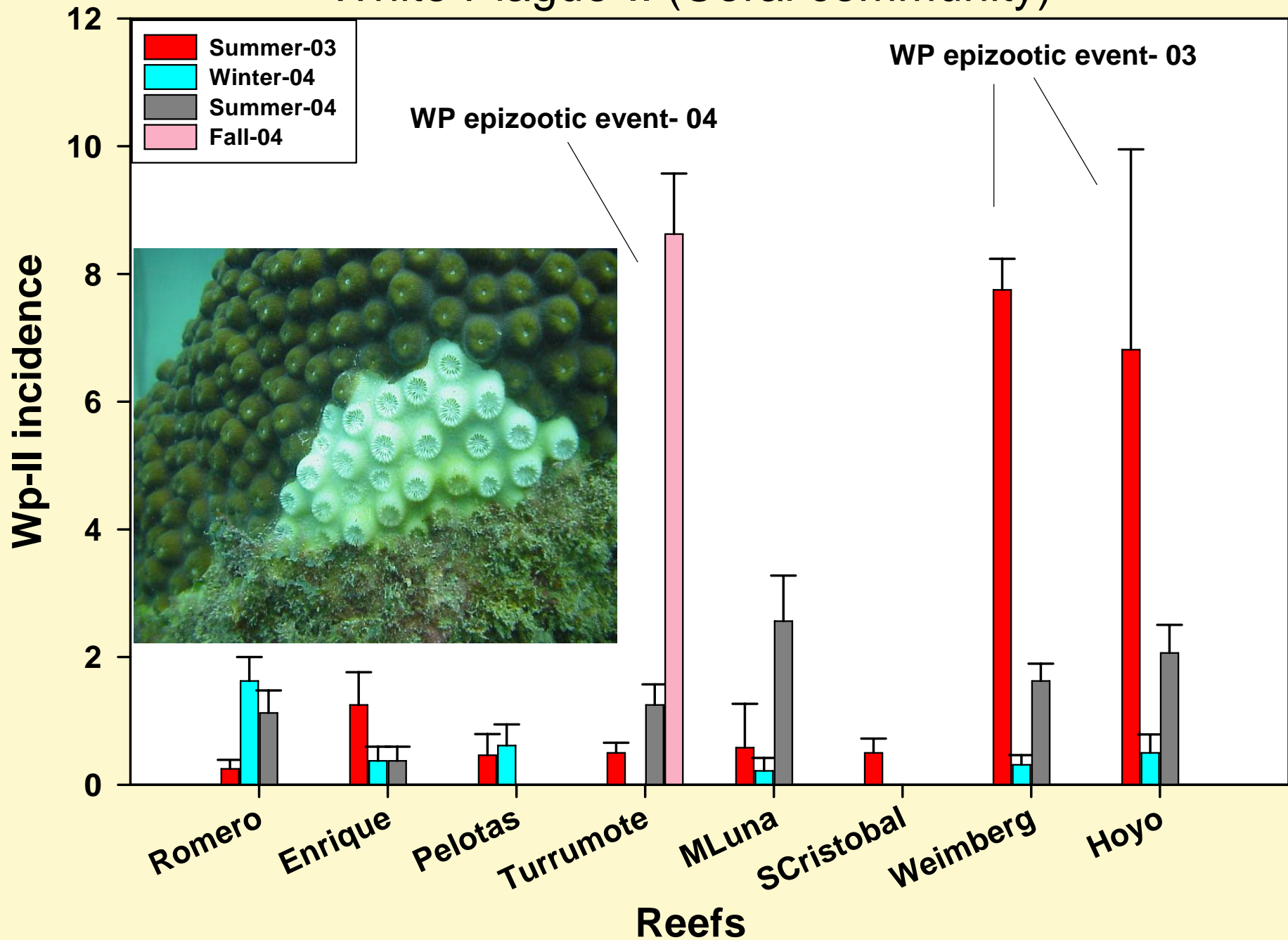




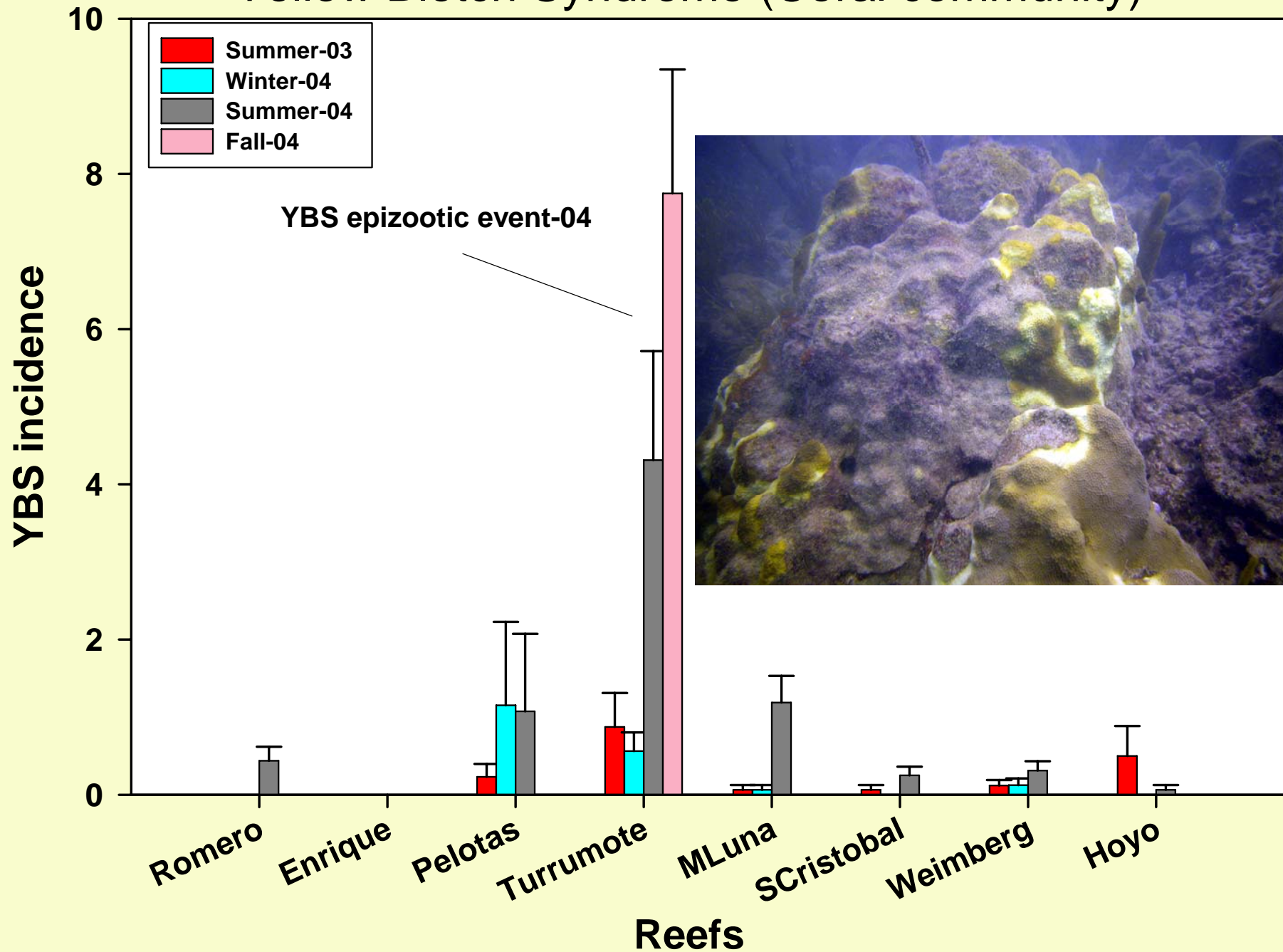
## Bleaching (Coral community)

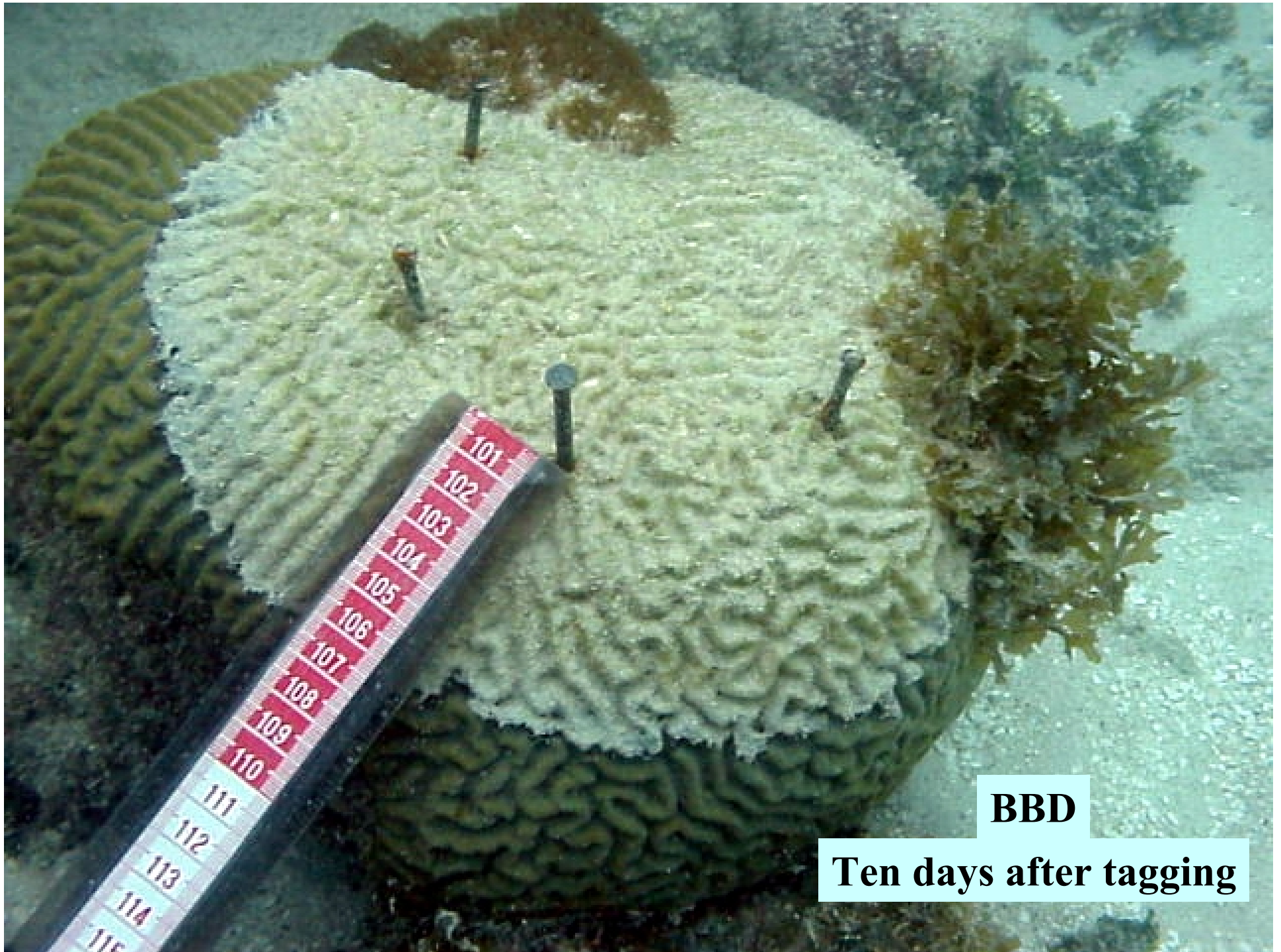


# White Plague-II (Coral community)



# Yellow Blotch Syndrome (Coral community)

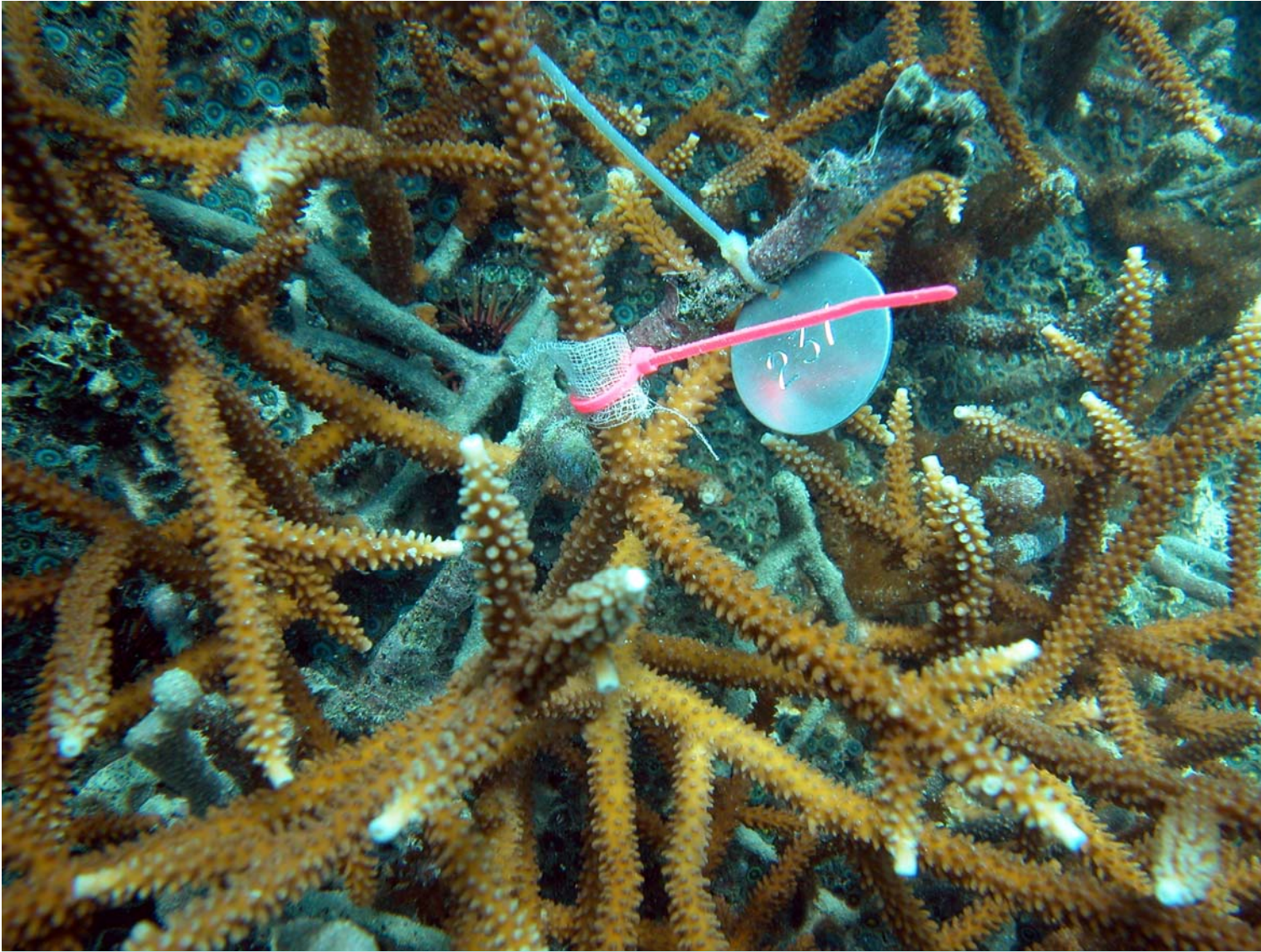




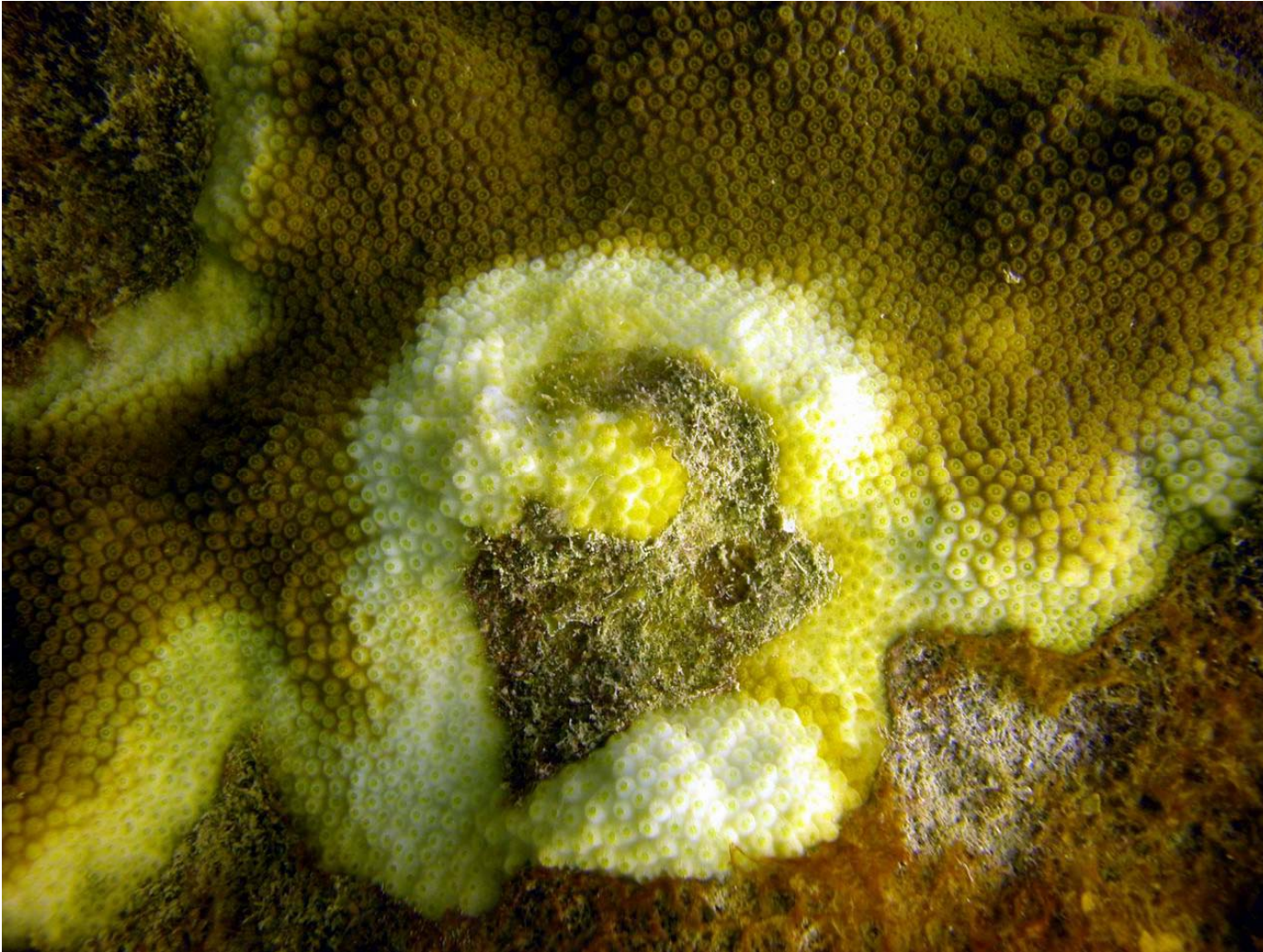
**BBD**

**Ten days after tagging**

# White Band Disease



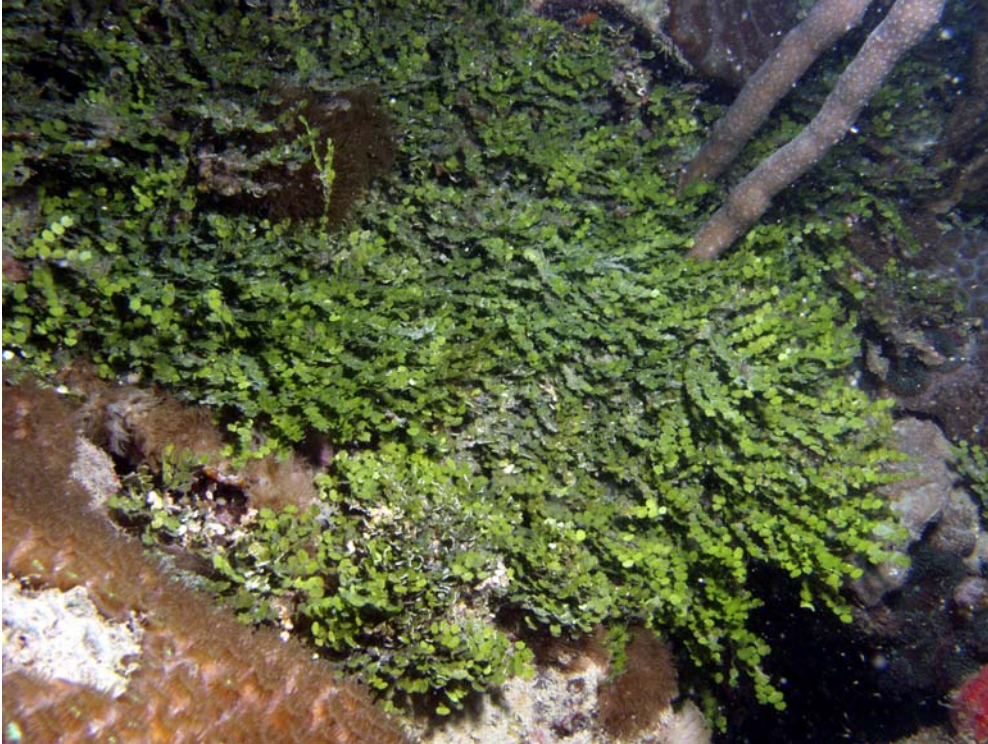
Isolate from *A. cervicornis* with WBD when reinoculated onto healthy *A. cervicornis* caused WBD. The isolate was identified as *Vibrio carchariae/harveii*



## **Yellow Blotch Disease**

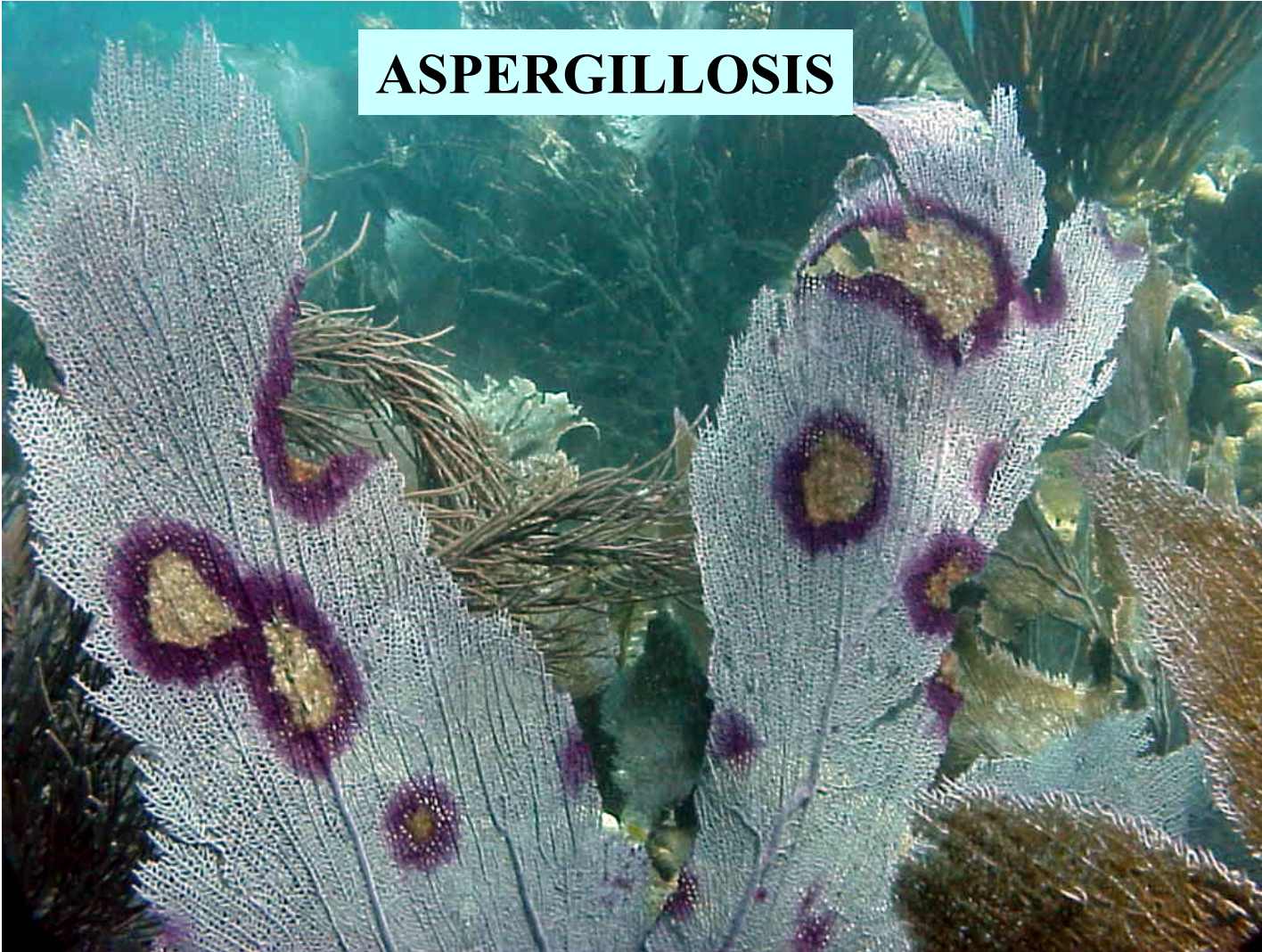
**Yellow blotch affected coral colonies were found to have a high concentration of different species of *Vibrio*.**

## Disease Reservoir ?



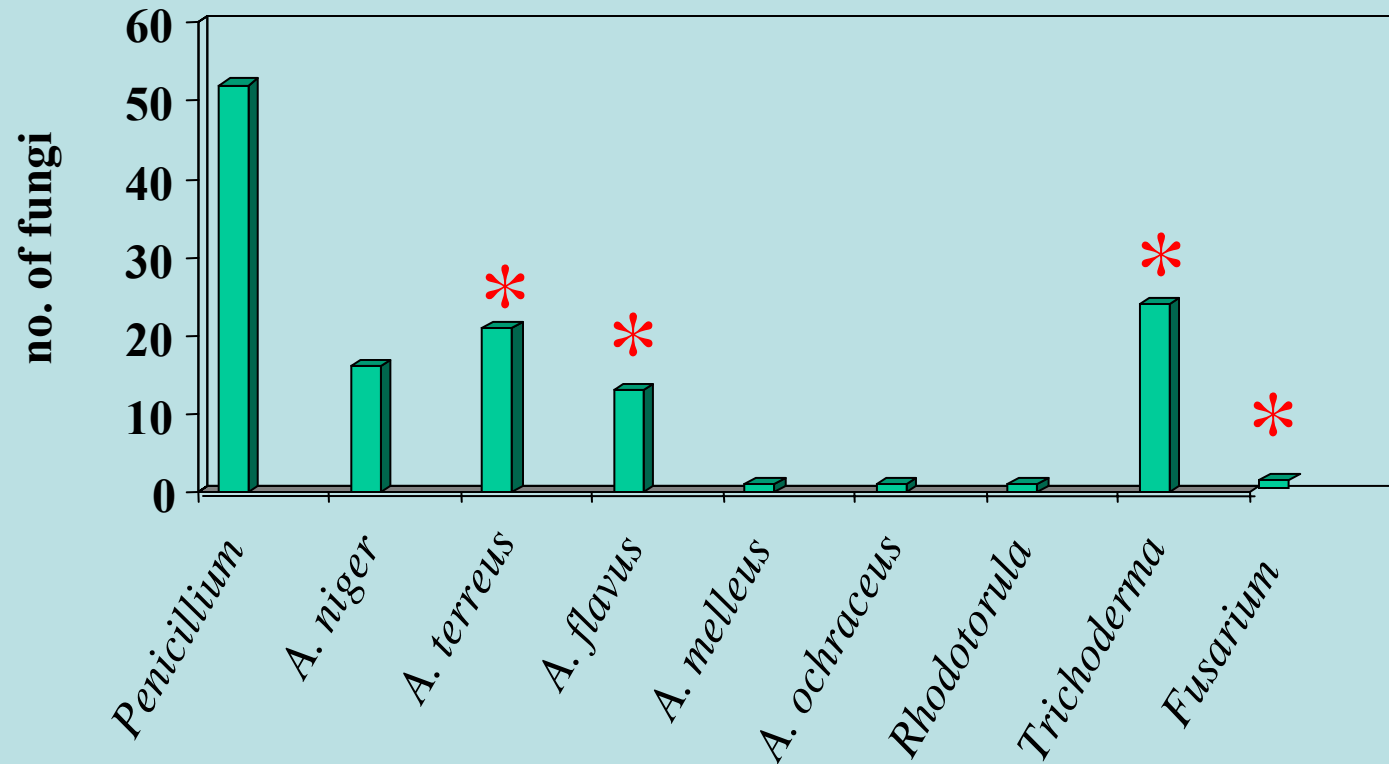
Bacteria from White Plague, *Aurandimonas coralicida*, found in Halimeda

## ASPERGILLOSIS



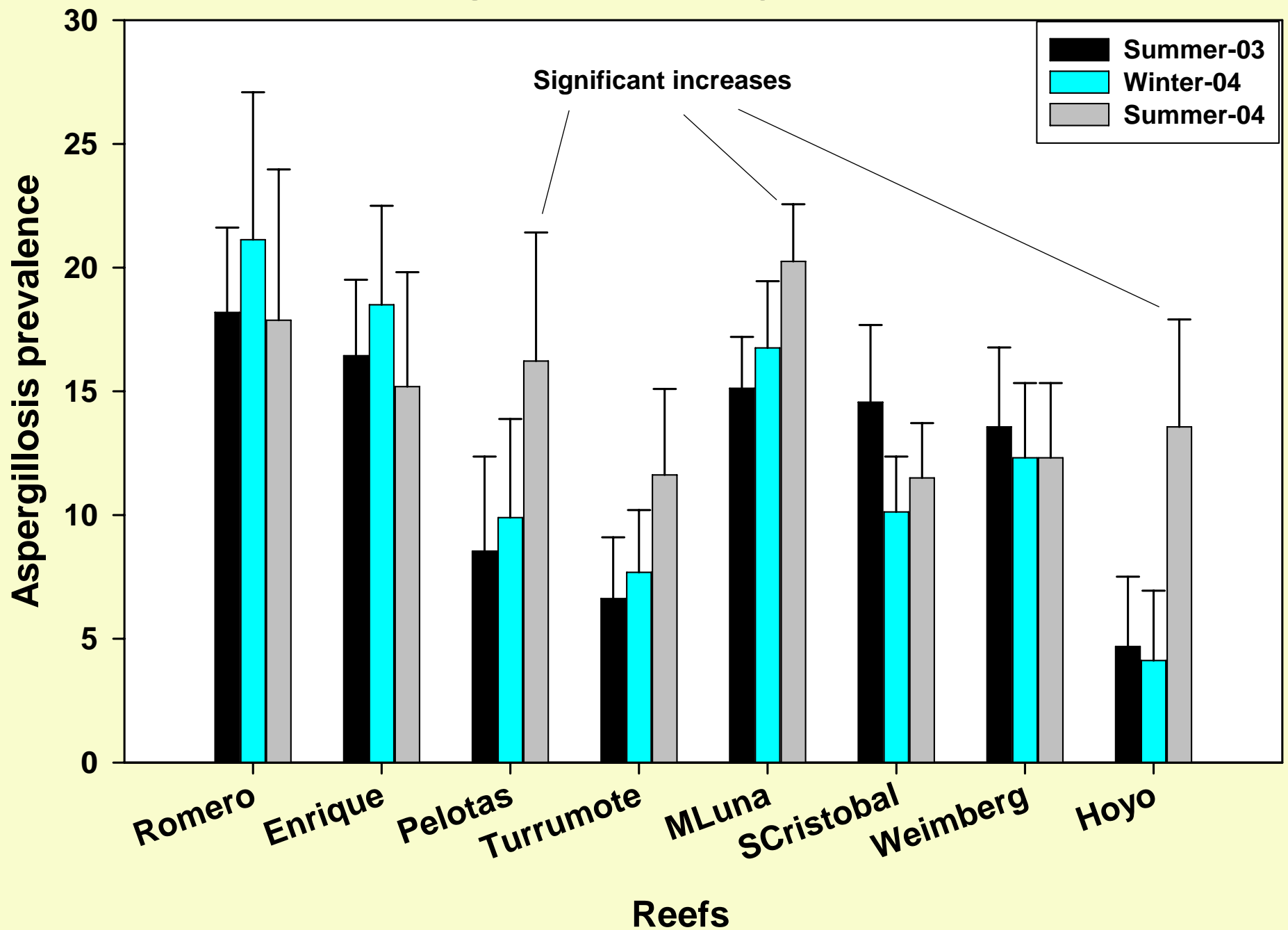
Sea fans were assayed for the normal microbiota associated with healthy, diseased and healthy areas of diseased colonies. Metabolic profiles and amount of fungi were significantly different among the different sources

# Fungal community



\* Confirmed by sequencing

# Aspergillosis in *Gorgonia ventalina*



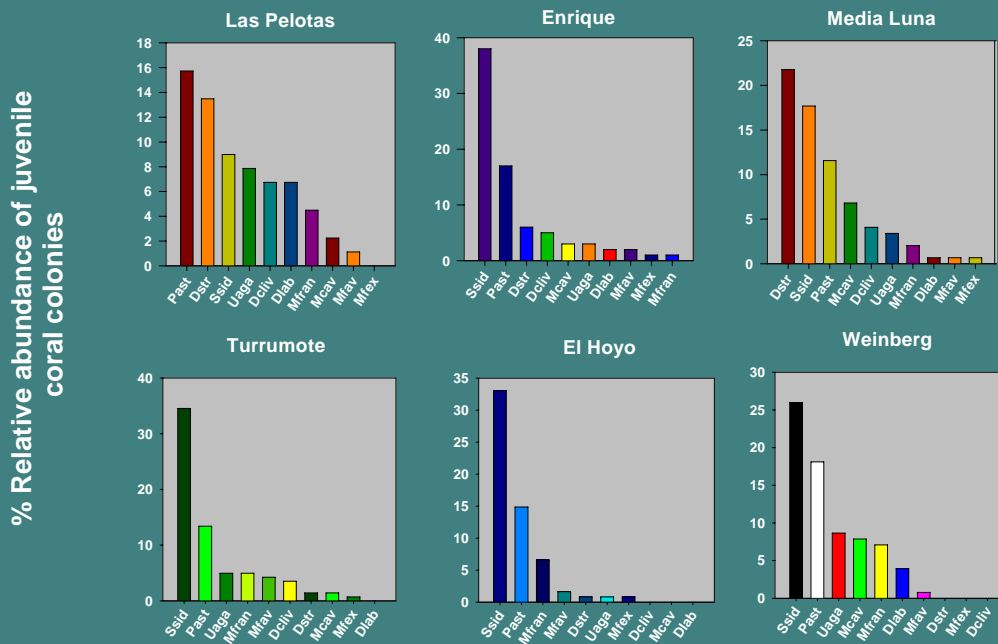
# Recruitment

Density of juveniles highest for shallow & intermediate depths

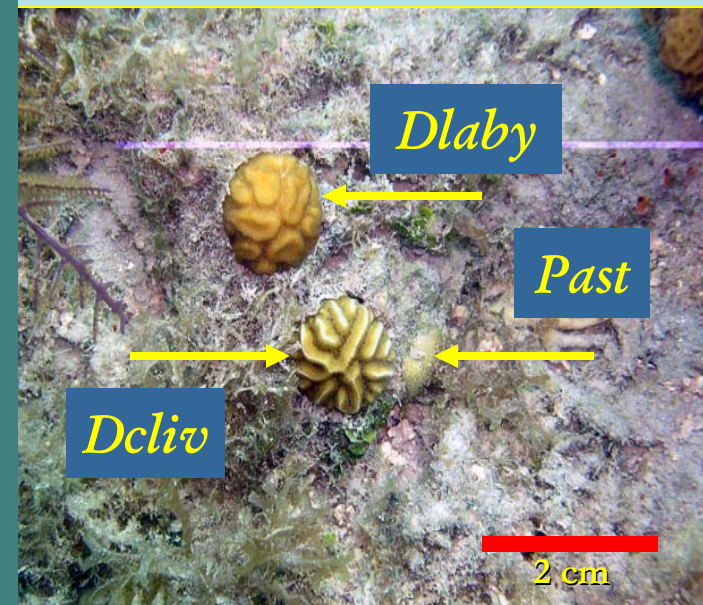
Between 23 to 31 species of juvenile corals were present across reefs zones. Highest for the mid-shelf zone.

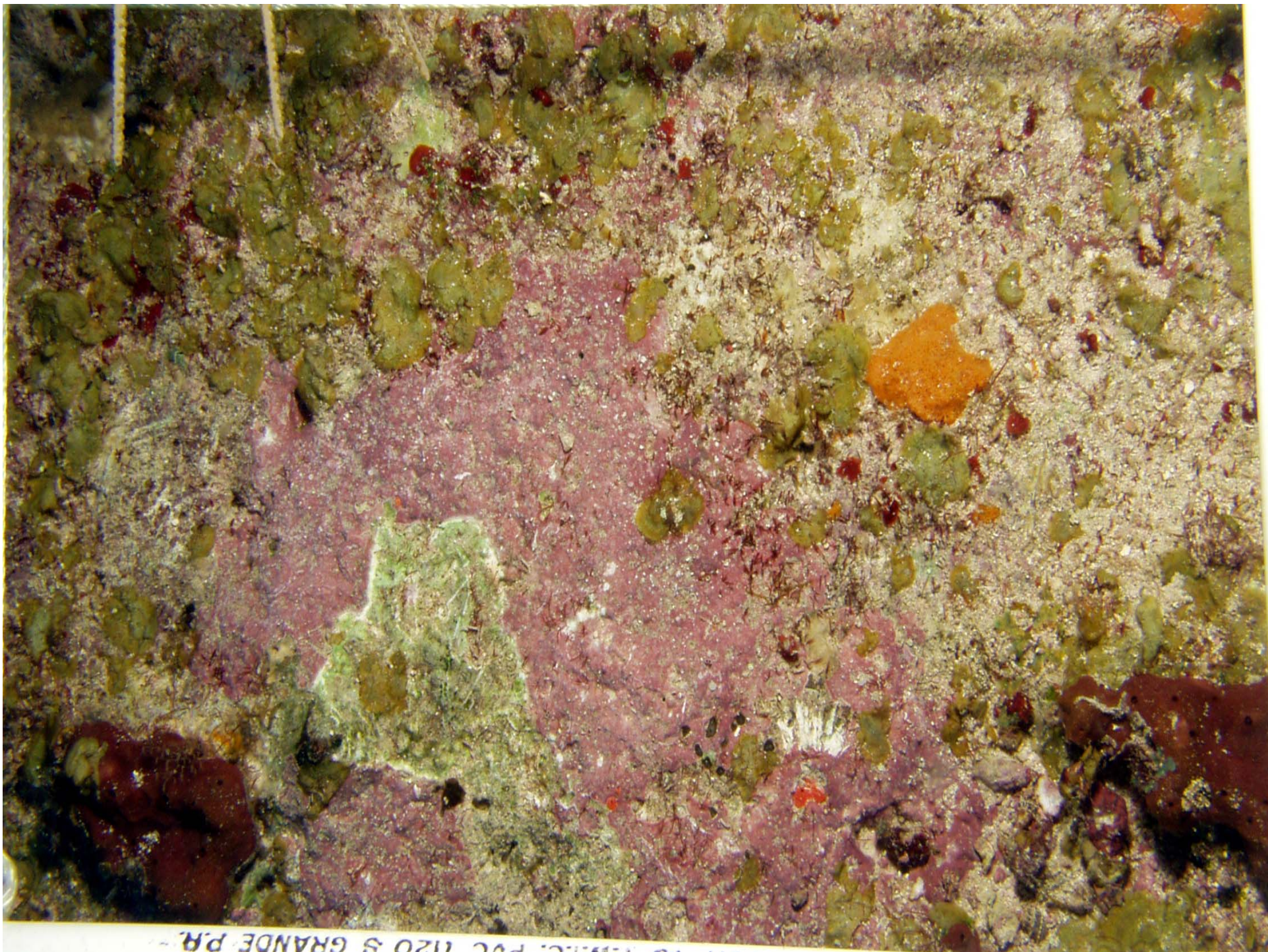
Most common: *S. siderea*, *P. astreoides*, *D. clivosa*, *D. strigosa*, *M. cavernosa*.

Distribution and relative abundance (%) of the main coral species for each of the reef site

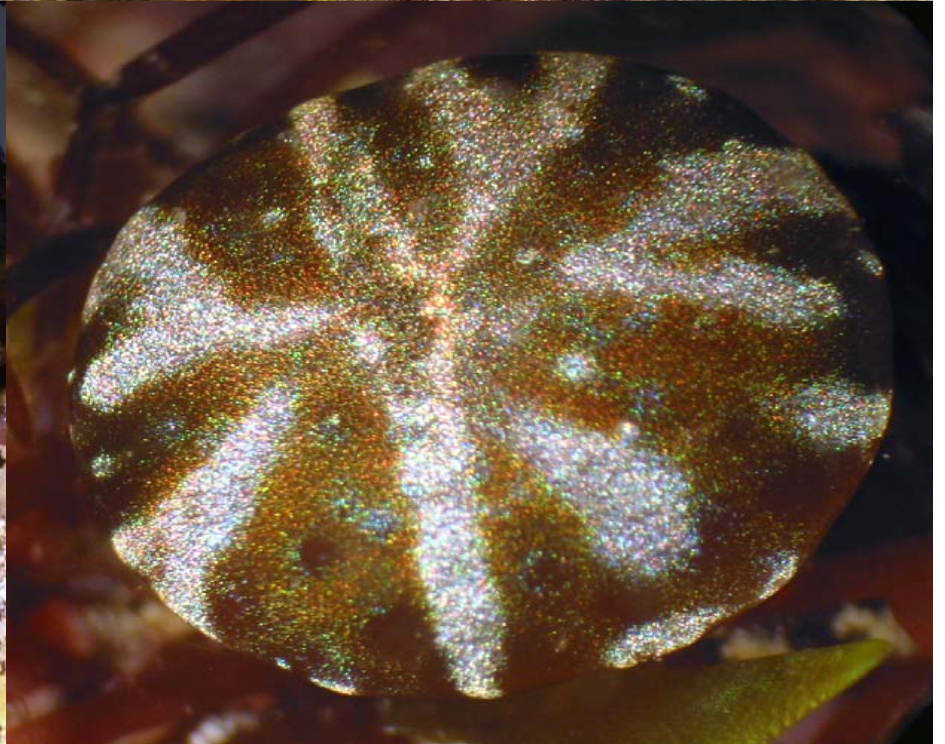
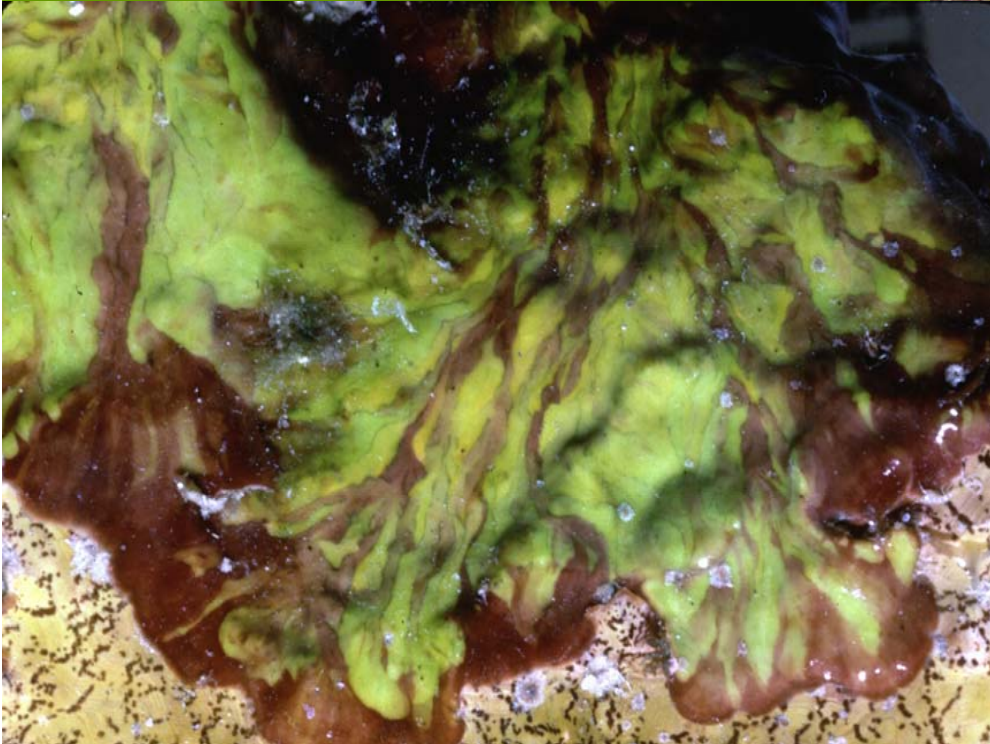
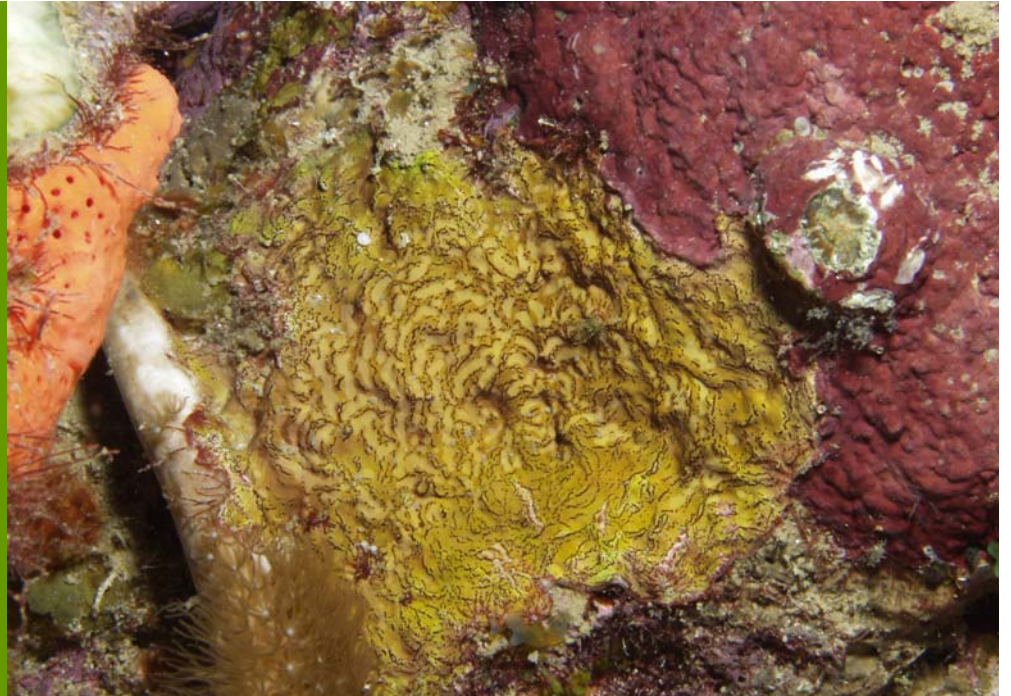


Main speeis observed at each reef site

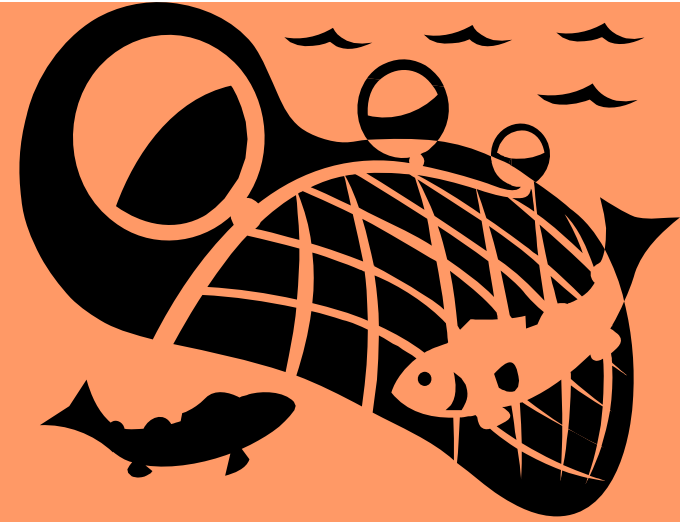




# New Species of Algae



# Interview Activity



## West Coast

- Three interview schedules: species and ecology, habitats, and life history of species
- Two sets of interviews
- 50 Fishermen

## South Coast

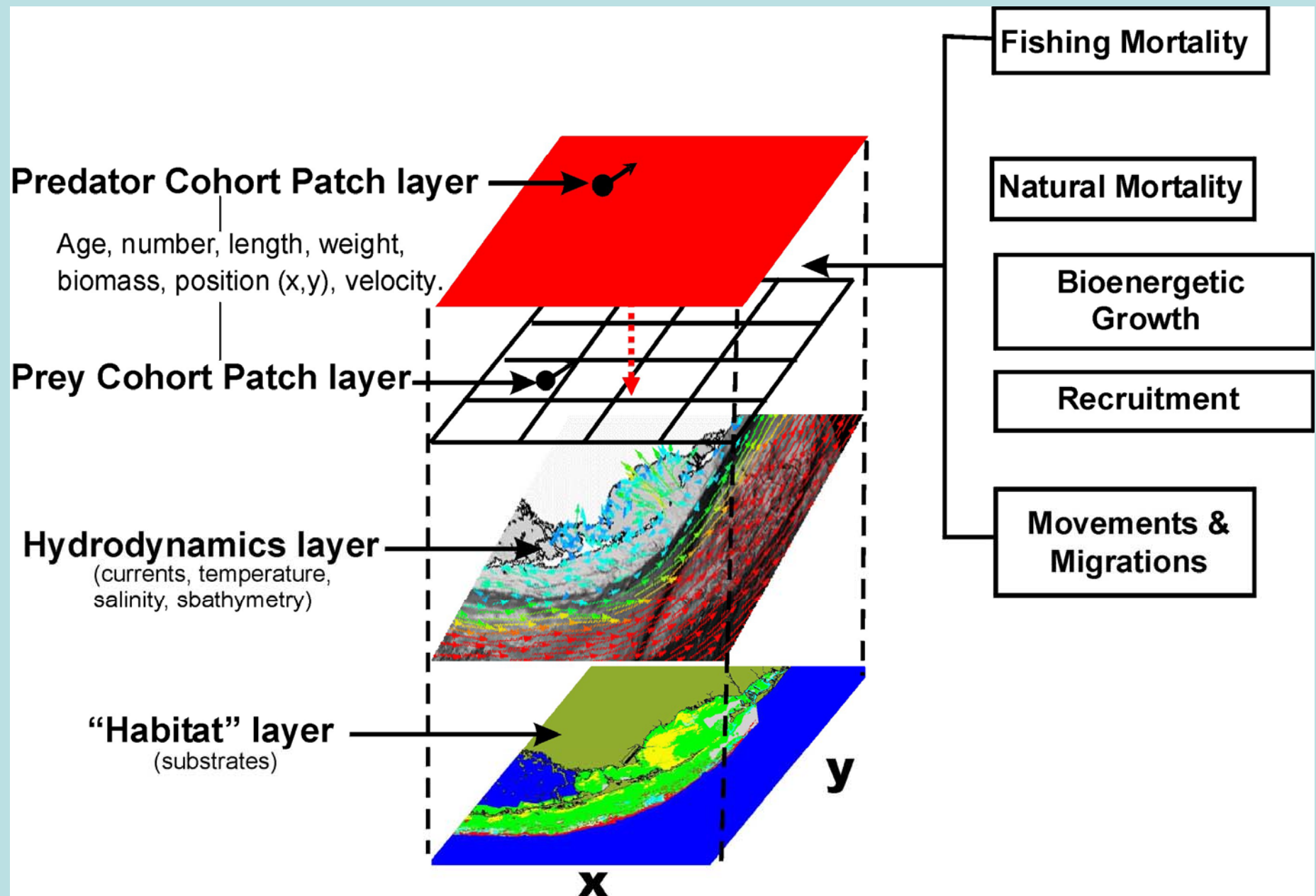
- 100 In-depth interviews on species
- In-depth interviews on landscape
- Success and knowledge
- Ethnographic observations of the fishing activities in the region.

# Qualitative and quantitative data

- Information on species (behavior and stocks)
- Description of the food chain (similar to social networks)
- Description of habitats
- Key issues affecting the fisheries
- Complex construction of themes and topics
- Software for social and cultural analysis

- A theme that emerges very strongly is that a discourse of **Coastal Ecological Memory as Social Resistance** has developed.
- Fishers and other coastal residents see themselves as the stewards of the coastal environment, keeping track of more powerful stakeholders' polluting activities around coastal areas.
- This collective ecological memory resulting from decades of watchfulness is an environmental history of sorts, and informs resistance against unilateral intervention by state regulatory agencies.

# GeoSpatial Model of Biophysical Dynamics





Spawning Aggregations  
At Mona Island  
Yellowtail Parrotfish  
Redhind  
Yellowfin Grouper  
Tiger Grouper  
Blue Tang ?

